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ADMINISTRATION REPORT  
OF THE  
AGRICULTURAL DEPARTMENT  
FOR THE FASLI 1369



*Asd(A) 1099*

AGRICULTURAL DEPARTMENT

**ADMINISTRATION REPORT**  
OF THE  
**AGRICULTURAL DEPARTMENT**  
FOR THE FASLI 1369

(For the period from 1st July 1959 to 30th June 1960)



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GOVERNMENT OF MADRAS  
1961

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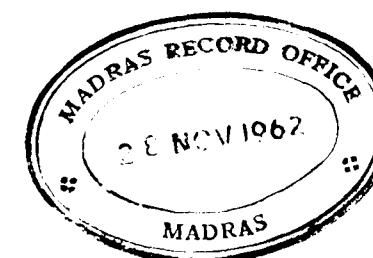
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## ADMINISTRATION REPORT OF THE AGRICULTURAL DEPARTMENT FOR THE PERIOD FROM 1ST JULY 1959 TO 30TH JUNE 1960.

### I. ADMINISTRATION.

Sri A. Venkatesan, I.A.S., continued to hold the post of Director of Agriculture, throughout the period under report.

The following Joint Directors of Agriculture also continued during the period under report :—

Sri C. R. Seshadri, Joint Director of Agriculture (Planning and Development).

Sri N. Sankaranarayana Reddi, Joint Director of Agriculture (Engineering).

Sri M. Obaidullah Shah, Joint Director of Agriculture (State Seed Farm).

Sri K. S. Narasimha Mudaliar, continued as Personal Assistant to the Director of Agriculture, throughout the period under report.

The cadre strength of the Gazetted posts in the department continued to be 64.

The following officers were on deputation under the Government of India :—

(1) Dr. G. S. Siddappa, Government Agricultural Chemist, now Senior Scientific Officer, Central Food Technological Research Institute, Mysore, from 8th December 1955.

(2) Sri P. S. Krishnamurthy, Assistant Entomologist, now Assistant Director under the Government of India, Ministry of Food and Agriculture, from 16th October 1952.

(3) Sri S. Sampath, Cytogeneticist, now Cytologist at the Central Rice Research Institute, Cuttack, from 20th January 1953.

(4) Sri C. R. Subramaniam, Assistant Agricultural Engineer (Mechanical), as Senior Lecturer, Government Polytechnic, New Delhi, from 26th February 1959.

(5) Sri J. P. Walter Devasahayam, Assistant Agricultural Engineer (Mechanical), now Assistant Executive Engineer (Electrical and Mechanical) in the Military Engineering Service, Government of India, from 18th June 1954.

(6) Sri R. Govindan Menon, Assistant Agricultural Engineer (Research), now Agricultural Engineer, Indian Institute of Sugarcane Research, Radhruck, Lucknow, from 15th November 1954.

(7) Sri C. S. Balasubramanyam, Assistant Entomologist, now Assistant Director (Storage), Government of India, Nagpur, from 4th January 1955.

(8) Sri S. Narayanaswamy, Assistant Agricultural Engineer, now working as Assistant Soil Conservation Officer (Engineering) under the Government of India, from 19th March 1955.

(9) Sri T. K. Thangavelu, Deputy Director of Agriculture, now working as Deputy Divisional Manager, State Trading Corporation of India (Private), Limited, Madras, from 1st March 1957.

(10) Sri K. Fazlulakhan, Horticulturist, now working as Cashew and Species Development Officer, under the Government of India, Ernakulam.

(11) Dr. M. Srinivasan, Lecturer in Agricultural Economics, now working as Senior Marketing Officer under the Directorate of Marketing and Inspection, Nagpur, from 21st November 1957.

(12) Sri N. Muthuswamy Naidu, Assistant Entomologist, now working as Assistant Director (Storage and Movements), Madras, Government of India.

(13) Sri V. Srinivasan, Assistant Agricultural Engineer, Assistant Soil Conservation Officer (Agronomy) under the Government of India, from 8th July 1958.

(14) Sri M. D. Azariah, Superintendent, Agricultural Research Station, Nanjanad, as Assistant Botanist, Potato Experimental and Trial Centre, Ootacamund, from 22nd July 1958.

(15) Sri A. R. Bhaskaran, District Agricultural Officer, working as Assistant Soil Conservation Officer (Agronomy) under the Government of India at Bellary, from 16th October 1958.

The following officers were on foreign service :—

(1) Sri L. Krishnan, District Agricultural Officer, working as Lecturer in the Regional Co-operative Training Centre, Madras, from 15th June 1957.

(2) Sri C. Raman Moosad, District Agricultural Officer, as Secretary, Coimbatore Market Committee, Tiruppur, from 20th June 1957.

(3) Sri R. S. Subramanyam, Assistant Agricultural Engineer, now working as Principal, Nachimuthu Polytechnic, Pollachi, from 1st June 1957.

(4) Sri M. Umapathy, Assistant Agricultural Engineer, now working as Assistant Engineer, under the Neyveli Lignite Corporation, Limited, from 19th May 1957.

(5) Sri K. A. Shaikat Ali, District Agricultural Officer, as Secretary, Tiruchirappalli Market Committee, from 2nd March 1960.

(6) Sri V. Mahimaiddoss, District Agricultural Officer, Inspection and Storage Officer, State Warehousing Corporation, Madras, from 10th November 1959.

(7) Sri A. K. Subramanian, Assistant Agricultural Engineer (Mechanical) as Executive Engineer, Neyveli Lignite Corporation, from 24th April 1959.

(8) Dr. V. Santhanam, Reader in Genetics as Head of the Regional Research Centre, Pircom (Indian Council of Agricultural Research), Coimbatore, from 6th April 1960.

The following officers were on duty under other Governments :—

Sri B. Santhanakrishna Naidu, Deputy Director of Agriculture, as Director of Agriculture, Pondicherry Government, from 7th August 1959.

Sri K. Ramaswamy, Paddy Specialist (Retired), as Rice Specialist, under the Government of United Kingdom, Cambia, West Africa.

The following officers were deputed for training under the various foreign aid programme :—

Sri A. R. Seshadri, Assistant Entomologist, deputed to U.S.A., from 21st January 1959.

Sri C. R. Shanmugam, Assistant Agricultural Engineer (Soil Conservation), deputed to Canada, from 3rd October 1959.

Sri T. B. Krishnasamy Rao, Assistant Cotton Specialist, Post-Graduate Training Institute, Coimbatore, from 21st September 1959.

The following new posts were sanctioned during the period under report :—

(1) Special Officer for drafting a Bill for sugarcane (for three months from 1st January to 31st March 1960).

(2) Assistant Marketing Officer (Survey), Madras.

(3) Assistant Marketing Officer, Madras (Agmarks).

(4) Assistant Marketing Officer (Regulated Markets), Madras.

(5) Additional Lecturer in Agricultural Economics, Agricultural College and Research Institute, Coimbatore.

- (6) Assistant Millet Specialist, Dolichos Lab-Lab Scheme, Coimbatore.
- (7) Crop and Plant Protection Officer, Mycology, Madurai.
- (8) Crop and Plant Protection Officer, Entomology, Thanjavur.
- (9) Survey Officer, Extension Centre, Coimbatore.
- (10) Assistant Oilseeds Specialist, Gingelly, Karur (Tiruchirappalli).
- (11) Assistant Paddy Specialist, Saline and Alkaline Resistant strains of paddy, Coimbatore.
- (12) Assistant Paddy Specialist, Seed Dormancy Scheme, Coimbatore.
- (13) Assistant Agricultural Engineer (Soil Conservation), Dry Farming Scheme, Palladam.
- (14) Assistant Agricultural Engineer (Soil Conservation), Salem.
- (15) Assistant Agricultural Engineer (Soil Conservation), Dry Farming Scheme, Batlagundu.
- (16) Professor of Agronomy, Post-Graduate Research Institute, Coimbatore.
- (17) Assistant Agricultural Engineer (Mechanical), Cuddalore.
- (18) Assistant Agricultural Engineer (Mechanical), Tirunelveli.
- (19) Assistant Marketing Officer (Propaganda and Publicity) Madras.
- (20) Assistant Agricultural Engineer (Soil Conservation) Training of Sub-Assistants, Coimbatore.
- (21) Reader in Entomology, Post-Graduate Research Institute, Coimbatore.
- (22) Assistant Agricultural Chemist, Parambikulam Project Coimbatore.
- (23) Algologist, Agricultural College and Research Institute Coimbatore.
- (24) Assistant Entomologist, Vegetable Scheme, Coimbatore.
- (25) Assistant Mycologist, Blue-Green Algæ Scheme Coimbatore.
- (26) Additional Lecturer in Chemistry, Coimbatore.
- (27) Assistant Soil Chemist, Soil Testing Laboratory Aduthurai.
- (28) Assistant Mycologist, Vegetable Scheme, Coimbatore.
- (29) Assistant Horticulturist, Kanyakumari.
- (30) Assistant Oilseeds Specialist, Salem.

- (31) Assistant Soil Chemist, Soil Testing Laboratory, Coimbatore.
- (32) Assistant Agronomist, Black Soil Scheme, Koilpatti.
- (33) Research Engineer, Agricultural College and Research Institute, Coimbatore.
- (34) Joint Director of Agriculture, Intensive Agricultural Development Programme, Package Deal, Thanjavur.
- (35) to (37) Assistant Extension Specialists, Coimbatore (three posts).
- (38) Extension Specialist, Coimbatore.
- (39) Assistant Marketing Officer (upgraded post), Madras.
- (40) The post of Horticulturist and Associate Professor of Horticulture, Coimbatore, was revived on 16th October 1959.

The following posts were abolished during the period :—

- (1) Assistant Agricultural Engineer, Groundnut Scheme, Coimbatore.
- (2) Cytogenetist, Groundnut Scheme, Coimbatore.
- (3) Reader in Plant Pathology, Coimbatore.
- (4) Special District Agricultural Officer, Crop Sampling, Madurai.
- (5) Agriculturist, Coimbatore.

The headquarters of the post of Assistant Director of Agriculture (Drilling), Coimbatore, was shifted to Salem.

## II. INSPECTION AND AUDIT.

### INSPECTION.

During the period under report, the Central Office, Agricultural College and Research Institute, Coimbatore, was inspected by the Director of Agriculture, Madras, on 12th and 13th May 1960. No serious irregularities were noticed during the inspection. The offices of the Deputy Directors of Agriculture, Madurai and Madras, were also inspected by the Director of Agriculture on 7th September 1959 and 17th January 1960, respectively.

All the offices in the department which are in charge of Gazetted Officers, who have been declared as heads of offices, are annually inspected by the respective Controlling Officers. The inspections confine to routine office inspection and the inspecting officers have to complete the inspection of offices assigned to them before the close of the calendar year. Review on the inspection of

officers carried out for the half-year ending 31st December 1959 has been sent to Government. The review for the half-year ending 30th June 1960 will be submitted to Government shortly.

The names of offices inspected by the officers at headquarters and Deputy Director of Agriculture are furnished below :—

| <i>Serial number and name of the Inspecting Officer.</i>            | <i>Offices inspected during the half-year ending 31st December 1959.</i>                                                                                                                                                                                                                      | <i>Offices inspected during the half-year ending 30th June 1960.</i>            |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| (1)                                                                 | (2)                                                                                                                                                                                                                                                                                           | (3)                                                                             |
| 1 Dean and Additional Director of Agriculture.                      | Sugarcane Specialist, Cuddalore, Horticulturist, Periakulam, Banana Research Officer, Aduthurai.                                                                                                                                                                                              | Nil.                                                                            |
| 2 Joint Director of Agriculture (Inspection and General), Madras.   | State Marketing Officer, Deputy Director of Agriculture, Madras, Deputy Director of Agriculture, Thanjavur, Deputy Director of Agriculture, Madurai, Deputy Director of Agriculture, Coimbatore, Assistant Marketing Officer, Madurai, Crop and Plant Protection Officer (Mycology), Madurai. | Nil.                                                                            |
| 3 Joint Director of Agriculture (Planning and Development), Madras. | Cane Development Officer, Tiruchirappalli, Cotton Extension Officer, Coimbatore, Oilseeds Development Officer, Coimbatore, Cane Development Officer, Madras, State Compost Development Officer, Madras.                                                                                       | Cotton Extension Officer, Coimbatore, Oilseeds Development Officer, Coimbatore. |
| 4 Joint Director of Agriculture (Engineering).                      | General Superintendent, Industrial Engineering Workshop, Madras.<br>Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.                                                                                                                                                            | Nil.                                                                            |
| 5 Agricultural Engineer, Madras.                                    | Assistant Agricultural Engineer, Saidapet.                                                                                                                                                                                                                                                    | Nil.                                                                            |
| 6 Compost Development Officer, Madras.                              | Field Manure Officer, Thanjavur, Field Manure Officer, Madurai, Field Manure Officer, Coimbatore.                                                                                                                                                                                             | Nil.                                                                            |
| State Marketing Officer Madras.                                     | Assistant Marketing Officer, Madurai.                                                                                                                                                                                                                                                         | Assistant Marketing Officer, Tiruchirappalli.                                   |

| <i>Serial number and name of the Inspecting Officer.</i> | <i>Offices inspected during the half-year ending 31st December 1959.</i>                                                                                                                                                                                                                                                                                                                                                                                                                          | <i>Offices inspected during the half-year ending 30th June 1960.</i>                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                                                      | (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (3)                                                                                                                                                                                                                                                                                                                                                                                                            |
| 8 Deputy Director of Agriculture, Madras.                | Superintendent Agricultural Research Station, Tirukuppam, District Agricultural Officer, Chingleput, Superintendent, Agricultural Research Station, Tindivanam, Superintendent, Sugarcane Research Station, Gudiyatham, District Agricultural Officer, Vilupuram, District Agricultural Officer, Polur, Assistant Director (Drilling), Coimbatore, District Agricultural Officer, Vellore, Assistant Agricultural Engineer (Soil Conservation), Panrui, District Agricultural Officer, Cuddalore. | Sugarcane Research Station, Gudiyatham, Assistant Agricultural Engineer (Inspection), Vellore, Assistant Agricultural Engineer, Cuddalore, District Agricultural Officer, Cuddalore, Assistant Director (Drilling), Chidambaram, Superintendent, Agricultural Research Station, Tindivanam, Superintendent, Agricultural Research Station, Tirukuppam.                                                         |
| 9 Deputy Director of Agriculture, Thanjavur.             | Superintendent, Agricultural Research Station, Pattukkottai, Assistant Entomologist, (Paddy Stem Borer Scheme), Aduthurai, Assistant Mycologist, Aduthurai, District Agricultural Officer, Tiruchirappalli (North), Superintendent, Agricultural Research Station, Agricultural Assistant, Agricultural Engineer (Inspection), Tiruchirappalli, Cashewnut Development Officer, Thanjavur, District Agricultural Officer, Thanjavur.                                                               | District Agricultural Officer, Tiruchirappalli (South), District Agricultural Officer, Mayuram, District Agricultural Officer, Kumbakonam.                                                                                                                                                                                                                                                                     |
| 10 Deputy Director of Agriculture, Madurai.              | Assistant Agricultural Engineer (Soil Conservation Scheme), Kodakkal, Superintendent, Agricultural Research Station, Koilpatti, District Agricultural Officer, Sattur, Certification Officer, Rajapalayam, District Agricultural Officer, Tirumelveli, District Agricultural Officer, Dindigul, Assistant Agricultural Engineer, Madurai, District Agricultural Officer, Sivaganga, District Agricultural Officer, Madurai, Assistant Agronomist, Pandiarajapuram.                                | Assistant Cotton Specialist, Koilpatti, Assistant Cotton Specialist, K-2 Scheme, Koilpatti, Cotton Certification Officer, Rajapalayam, Assistant Horticulturist, Ceyo Comorin, Assistant Cotton Specialist, Srivilliputhur, Superintendent, Rice Research Station, Ambasamudram, District Agricultural Officer, Nagercoil, Assistant Agronomist, Pandiarajapuram, District Agricultural Officer, Sankarankoil. |

## AUDIT BY INTERNAL AUDIT PARTIES.

In all, there are seven audit parties (each consisting of one Superintendent and two Upper Division Clerks) functioning in the department, out of which, four parties are attached to the four Regional Deputy Directors of Agriculture, Madras, Coimbatore, Madurai and Thanjavur. The remaining three parties are stationed at headquarters of which one party is solely attending to the audit of accounts of the Soil Conservation Schemes in the State for every half-year. The audit parties functioning under the Regional Deputy Directors of Agriculture have been entrusted with the audit of accounts of the Agricultural Depots under intensive and non-intensive areas, State Seed Farms and all the offices under their administrative control such as offices of District Agricultural Officers, Assistant Agricultural Engineers, Agricultural Research Stations, etc. The other two parties in the office of the Director of Agriculture, Madras, are attending to the audit of accounts of office and institutions under the direct control of the Director of Agriculture, Madras, such as the centralised office of the Agricultural College and Research Institute, Coimbatore and sections under the control of Dean, offices of the Assistant Agricultural Engineer (Tractor Workshop), Coimbatore, the Assistant Agricultural College and Research Institute, Coimbatore, and sections culture, the State Marketing Officer, Madras, the Cane Development Officers, etc. The headquarters audit parties have also to attend to the test-audit of accounts of the offices already audited by the Regional Deputy Directors of Agriculture. These parties are also required by the Director of Agriculture as and when need arises to take up special audit in connection with the investigation of irregularities in accounts of any of the offices or institutions in the department.

2. *Progress of audit.*—A statement showing the number of offices and institutions to be audited under the control of the Director of Agriculture and each of the Deputy Director of Agriculture and the number audited during the year under report is given below :—

| Office to which the audit party is attached.       | Number of offices and institutions to be audited. | Number audited during the year. | Balance |
|----------------------------------------------------|---------------------------------------------------|---------------------------------|---------|
| (1)                                                | (2)                                               | (3)                             | (4)     |
| I. Office of the Director of Agriculture, Madras.  | 120                                               | 22                              | 98      |
| II. Office of the Deputy Directors of Agriculture— |                                                   |                                 |         |
| 1 Thanjavur .. ..                                  | 218                                               | 85                              | 133     |
| 2 Coimbatore .. ..                                 | 133                                               | 83                              | 50      |
| 3 Madras .. ..                                     | 125                                               | 25                              | 100     |
| 4 Madurai .. ..                                    | 102                                               | 17                              | 85      |

| Serial number and name of the inspecting Officer. | Officers inspected during the half year ending 31st December 1959.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Officers inspected during the half year ending 30th June 1960.                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                                               | (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11 Deputy Director of Agriculture, Coimbatore.    | District Agricultural Officer, Coimbatore, District Agricultural Officer, Krishnagiri. Assistant Agricultural Engineer (Soil Conservation Scheme), Coonoor, Assistant Agricultural Engineer (Soil Conservation Scheme), Ootacamund. Assistant Horticulturist, Coonoor, District Agricultural Officer, Salem, District Agricultural Officer, Erode, Assistant Agricultural Engineer (Inspection), Coimbatore. Assistant Oilseeds Specialist, Pollachi, Assistant Cotton Specialist, Tiruppur, Assistant Agricultural Engineer (Soil Conservation Scheme), Coimbatore. Curator, Ootacamund Superintendent, Nanjund. | Superintendent, Agricultural Research Station, Bangalore, District Agricultural Officer, Krishnagiri, Assistant Director (Drilling), Salem, District Agricultural Officer, Ootacamund, Assistant Horticulturist, Coonoor, Curator, Ootacamund, Assistant Agricultural Engineer (Soil Conservation Scheme), Coonoor, Superintendent, Agricultural Research Station, Nanjund, Assistant Agricultural Engineer, (Soil Conservation Scheme), Ootacamund. |

## SURPRISE INSPECTION.

During the year 1959-60, surprise inspection of offices and stores was conducted by the superior officers of the department. The number of offices and depots inspected by them are furnished below :—

|                                                                  | Depots and Offices. |
|------------------------------------------------------------------|---------------------|
| 1 Director of Agriculture, Madras .. ..                          | 44                  |
| 2 Dean and Additional Director of Agriculture. ..                | 24                  |
| 3 Joint Director of Agriculture (Planning and Development) .. .. | 3                   |
| 4 Joint Director of Agriculture (Inspection and General) .. ..   | 19                  |
| 5 Joint Director of Agriculture (State Seed Farm) .. ..          | 10                  |
| 6 Joint Director of Agriculture (Engineering). ..                | 14                  |
| 7 Deputy Director (Drilling) .. ..                               | 4                   |
| 8 Agricultural Engineer (Headquarters) .. ..                     | 8                   |
| 9 Deputy Director of Agriculture, Madras .. ..                   | 19                  |
| 10 Deputy Director of Agriculture, Thanjavur .. ..               | 34                  |
| 11 Deputy Director of Agriculture, Madurai .. ..                 | 10                  |
| 12 Deputy Director of Agriculture, Coimbatore .. ..              | 27                  |
| 13 Associate Dean, Agricultural College, Coimbatore .. ..        | 24                  |

No serious irregularities were noticed as a result of the inspection.

The delay in completing the audit of all the institutions within the prescribed time is due mainly to the fact that the parties had to be diverted to the special audit of accounts of institutions wherein heavy losses, misappropriation, etc., were reported. The delay can also be partly attributed to the inadequacy of audit parties to cope with the audit of increasing number of offices and more time taken to complete the audit of each office on account of large increase in the volume of transactions and checking of *pro forma* accounts of the various Agricultural Engineering Schemes as required by the Accountant-General, Madras.

3. *Progress of clearance of audit objections.*—A statement showing the number of audit objections (raised in internal audit and by the Accountant-General, Madras) pending at the beginning of the year, the number of objections subsequently added during the year, the number of objections cleared during the year and the net pendency at the end of the year is given below :—

| Name of office.                                    | Number pending at the beginning of the year.    |                                                 | Number added during the year.          |             |
|----------------------------------------------------|-------------------------------------------------|-------------------------------------------------|----------------------------------------|-------------|
|                                                    | Audit reports.                                  | Objections.                                     | Audit reports.                         | Objections. |
| (1)                                                | (2)                                             | (3)                                             | (4)                                    | (5)         |
| I. Office of the Director of Agriculture, Madras.  | 346                                             | 5,744                                           | 171                                    | 4,791       |
| II. Office of the Deputy Directors of Agriculture— |                                                 |                                                 |                                        |             |
| 1 Thanjavur .. ..                                  | 209                                             | 5,153                                           | 84                                     | 2,897       |
| 2 Coimbatore .. ..                                 | 213                                             | 4,060                                           | 59                                     | 2,909       |
| 3 Madras .. ..                                     | 213                                             | 7,141                                           | 220                                    | 6,700       |
| 4 Madurai .. ..                                    | 301                                             | 9,210                                           | 85                                     | 1,659       |
| Name of office.                                    | Number of objections cleared out of column (3). | Number of objections cleared out of column (5). | Number pending at the end of the year. |             |
|                                                    |                                                 |                                                 | Audit reports.                         | Objections. |
| (6)                                                | (7)                                             | (8)                                             | (9)                                    | (10)        |
| I. Office of the Director of Agriculture, Madras.  | 2,620                                           | 829                                             | 421                                    | 7,086       |
| II. Office of the Deputy Directors of Agriculture— |                                                 |                                                 |                                        |             |
| 1 Thanjavur .. ..                                  | 1,448                                           | 195                                             | 235                                    | 6,407       |
| 2 Coimbatore .. ..                                 | 624                                             | 9                                               | 258                                    | 6,326       |
| 3 Madras .. ..                                     | ..                                              | 200                                             | 433                                    | 13,641      |
| 4 Madurai .. ..                                    | 544                                             | 45                                              | 330                                    | 10,280      |

In spite of stringent instructions issued stressing the need for prompt clearance of audit objections, the pendency of audit objections has increased. Therefore, in order to speed up the clearance

of objections, additional ministerial staff have since been sanctioned by Government to the Regional Deputy Directors of Agriculture and better progress can be expected in the next year. All the touring officers have also been instructed to scrutinise pending audit report files and arrange for their speedy disposal.

### III. AGRICULTURAL EDUCATION.

(i) *B.Sc. (Ag.) Degree Course.*—The second and final year B.Sc. (Ag.) classes for 1959-60 were in session from the beginning of the report. The regular classes for the I year B.Sc. (Ag.) class for 1959-60 commenced from 15th June 1959 after admitting the successful candidates in the Pre-Agricultural Examinations held in April 1959.

The number of admissions to the B.Sc. (Ag.) degree course at the Agricultural College, Coimbatore, which was fixed at 162 during the year 1956-57 continued to be the same. Out of 162 seats fixed, 106 seats were to be filled up by successful candidates in Pre-Agricultural Examination held in April 1959 while the balance of 56 seats were to be filled up as follows :—

|                                                                                       |       |
|---------------------------------------------------------------------------------------|-------|
| 1 Foreign nationals and students from other States (14-6) .. .. .                     | 8     |
| 2 Detained and failed students in First B.Sc. (Ag.) class, 1958-59 .. .. .            | 2     |
| 3 Reservation for Central Government employees' sons .. .. .                          | 2     |
| 4 Balance of students to be filled up by the selected candidates from Madras State .. | 44    |
|                                                                                       | <hr/> |
|                                                                                       | 56    |
|                                                                                       | <hr/> |

The number of applications received for admission to the B.Sc. (Ag.) degree course, 1959, was 100 while the number of candidates interviewed by the selection committee constituted for the purpose was 94. The number of seats for which the committee was asked to select candidates for the Agricultural College, Coimbatore, was 44 exclusive of two seats intended for sons of Central Government employees serving in Madras State, but not domiciled here. The selected list of candidates for filling up the vacancies in First Year B.Sc. (Ag.) class, 1959-60, was received from Government by 2nd July 1959 and all the selected candidates were asked to join the course by 8th July 1959. Almost all the candidates except a few joined the course and the vacancies arising due to the failure of the selected candidates were filled up by the candidates from the waiting list as per the instructions given by Government.

In pursuance of a decision taken by University of Madras and under instructions from Government, 37 students of the pre-professional course in Agriculture who has failed in one subject in April 1959 examination were admitted to the First Year B.Sc. (Ag.) degree course. The total strength of the First Year B.Sc. (Ag.) class was 184.

As such, all the 162 seats were duly filled up as per details shown below :—

|                                                                                                                                                                    |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1 Successful candidates in pre-Agricultural Examinations held in April 1959 ... ..                                                                                 | 106   |
| 2 Detained and failed students of First year B.Sc. (Ag.) class, 1958-59, who obtained the prior permission of Principal to join the course again in 1959-60 ... .. | 2     |
| 3 Foreign nationals and students from other States sponsored by Government of India.                                                                               | 8     |
| 4 Reservation of Central Government employees' sons ... ..                                                                                                         | 2     |
| 5 Nominees of Kerala State ... ..                                                                                                                                  | ..    |
| 6 Candidates of Madras State from the selected list and waiting list ... ..                                                                                        | 44    |
|                                                                                                                                                                    | <hr/> |
|                                                                                                                                                                    | 162   |
|                                                                                                                                                                    | <hr/> |

As per the specific instructions of Government, the 44 seats mentioned in item 6 were filled up by making selections on a State-wise basis instead of on district-wise basis as has been done up to the end of academic year 1958-59.

The number of students on roll in each of the three classes of B.Sc. (Ag.) at the end of academic year 1959-60 was as under :—

|                                     | Men.  | Women. | Total. |
|-------------------------------------|-------|--------|--------|
| First year B.Sc. (Agriculture) ...  | 180   | 4      | 184    |
| Second year B.Sc. (Agriculture) ... | 160   | 4      | 164    |
| Third year B.Sc. (Agriculture) ...  | 140   | 3      | 143    |
|                                     | <hr/> | <hr/>  | <hr/>  |
|                                     | 480   | 11     | 491    |
|                                     | <hr/> | <hr/>  | <hr/>  |

(ii) *Pre-professional course in Agriculture.*—Consequent on the reorganization of University courses, the Pre-professional course in Agriculture has been introduced from the academic year 1958-59.

For want of adequate laboratory facilities and equipments at the Agricultural College, Coimbatore, the course is being conducted at the following two colleges for the past three years. In regard to Pre-professional course in Agriculture at Queen Mary's College, Madras, during 1959-60 the course has been discontinued :—

(1) Government Arts College, Coimbatore—For men and women students.

(2) St. Xavier's College, Palayamkottai—For men students only.

The number of seats fixed for Pre-professional course in Agriculture is 102, but as per the Government orders only 100 seats had been fixed up. The balance of 2 seats out of 102 seats fixed for Pre-professional course in Agriculture were kept unissued so as to be fixed up in B.Sc. (Ag.) degree course in 1960-61 as per the particulars furnished below :—

|                                                                                                                         |       |
|-------------------------------------------------------------------------------------------------------------------------|-------|
| 1 reserved seats for foreign nationals and candidates from other States (to be sponsored by Government of India) ... .. | 14    |
| 2 Reservation for sons of Central Government employees in Madras State, but not domiciled here ... ..                   | 2     |
| 3 Failed and detained students ... ..                                                                                   | 8     |
|                                                                                                                         | <hr/> |
|                                                                                                                         | 24    |
|                                                                                                                         | <hr/> |

The above 138 candidates of Madras State have been admitted from the approved selection and waiting lists prepared by the Selection Committee. The number of applications received for admission to the Pre-professional course in Agriculture was 569, while the number of candidates interviewed by the Selection Committee was 210 only. The selected list of candidates for admission to the Pre-professional course in Agriculture was received on 16th July 1959 and all the candidates were advised to join the course at the two colleges mentioned above on 22nd July 1959. Some of the selected candidates failed to join the course, while some left the college after getting themselves first admitted for the course and obtaining seats for some other courses subsequently. All such vacancies were filled up by the candidates in the waiting list as per the directions issued by Government.

The details of students admitted to the Pre-professional course in Agriculture during 1959-60 in the two colleges are as shown below :—

|                                           | Seats. |
|-------------------------------------------|--------|
| 1 Government Arts College, Coimbatore ... | 94     |
| 2 St. Xavier's College, Palayamkottai ... | 54     |
|                                           | <hr/>  |
|                                           | 138    |
|                                           | <hr/>  |

As per the revised regulations of B.Sc. (Agriculture) degree course, the intensive practical farm training which was hitherto given to the final B.Sc. (Agriculture) students from 1st July to 31st December during their stay in final B.Sc. (Agriculture) class will not form part of the regular course of study. However the candidates who have passed the final B.Sc. (Agriculture) examination shall, before supplicating for the degree, undergo practical farm training for a period of six months. As a consequence of these revised regulations, the regulations relating to examination of all the three classes may commence by 15th June every year and the University examinations for all the three-year classes be held in the following March-April.

As such the College for all the three B.Sc. (Agriculture) classes for 1960-61 opened on 15th June 1960 itself. All the candidates who had secured a full pass or failed to secure a pass only in two subjects (reference) in the I B.Sc. (Agriculture) and II B.Sc. (Agriculture). University examinations were promoted to Second and Final B.Sc. (Agriculture) classes respectively. Regarding the I B.Sc. classes, 1960-61, all the 109 candidates who have secured a full pass in Pre-Agricultural examinations were advised to join the 1 year B.Sc. (Agriculture) class by 15th June 1960 while the casual vacancies and other reserved vacancies in I B.Sc. (Agriculture) class were filled up subsequently by the selected candidates and nominees of Government of India, etc. Besides twelve candidates who have failed in one subject only in the Pre-professional course examination held in April 1960 were advised to join the course as per proceedings of the Board of Studies in Agriculture held on 27th April 1960.

(iii) *Post-Graduate Course*.—Under the scheme for the establishment of a Regional Post-Graduate Training Centre at Coimbatore sanctioned in G.O. Ms. No. 2234, Food and Agriculture, dated 30th June 1958, the Post-Graduate Course (by study) leading to M.Sc. (Agriculture) and Ph.D. was instituted in the year 1958, and continued for the second year during the period under report. The scale of admission for the course continued to be fixed at 40 during the year 1959-60. The training which had been started originally with four faculties, viz., Plant Breeding and Genetics, Plant Pathology, Soil Science and Horticulture was subsequently expanded during 1959-60 by providing two more faculties, viz., Agronomy and Entomology, thus bringing the total number of faculties to six. During the period under report one candidate for Ph.D. in Horticulture and 38 candidates for M.Sc. (Agriculture) were admitted. One candidate out of the 38 selected for M.Sc. (Agriculture) however discontinued his studies for the reason that the University of Madras had not granted the requisite recognition of his qualifying examination. During this period ten students were granted State Government merit scholarship while in respect of five of the seniormost officers of this department admitted to

Post-Graduate Research Institute for M.Sc. (Agriculture) course concessions of study leave with leave salary equal to half average pay for twelve months in 1959-60 were sanctioned by the Government.

The construction of the new post-graduate Block building, the foundation stone of which was laid down by the President of India, Dr. Rajendra Prasad, during 1958 is nearing completion.

The Inspection of Commission constituted by the University of Madras to consider the question of affiliation of the Post-Graduate Research Institute to the University of Madras visited this Institute on 21st March 1960. The Commission examined the facilities available for housing the Post-graduate Institute, hostel for trainees, games and recreational activities as well as other facilities by way of laboratory equipments and staff provided, met the Dean subsequently and had discussed with regard to several matters connected with Post-graduate studies based on the information furnished already. In the report of the Commission which was forwarded to the Government by the Madras University, the Commission has recommended the affiliation of new Post-graduate course and also to increase the number of students in future years.

Study tours were also organised during the period under report and students of each Faculty were taken on tours under the leadership of Reader or Professor or the Research Assistant concerned in order to study the local agricultural practices of various tracts. The students were also taken to New Delhi to see the World Agricultural Fair.

(iv) *Post-Graduate Diploma Course in Horticulture*.—For want of adequate laboratory and other facilities and also the hostel accommodations this course had not been run from 1957-58 onwards.

(v) *Refresher Course in Agriculture for young farmers*.—The Government of Madras in their G.O. Ms. No. 2865, Food and Agriculture, dated 18th August 1958, communicated in Director of Agriculture's Endorsement No. YY. 3. 123, 58, dated 23rd August 1958, sanctioned the scheme for running the Refresher Course in Agriculture for 25 young farmers within the age group of 16 to 25 for a period of six months in order to give them all-round practical training in agriculture and allied subjects.

The seventh course of training for young farmers for a period of six months started on 15th August 1959 with 23 young farmers under the guidance of an instructor. Four trainees left the course after a short period leaving nineteen trainees till the end of the training. These trainees were given intense practical training in all aspects of improved agriculture, supplemented by lectures in Tamil. In addition the special lectures were delivered by the following Officers :—

- (a) The District Veterinary Officer, Coimbatore.
- (b) The Sheep and Goat Development Officer, Madras.



- (c) The Special Officer for Artificial Insemination.
- (d) The Poultry Development Officer, Madras.
- (e) All heads of sections at Agricultural College and Research Institute.
- (f) The Inspector, Key Village Scheme, Nangayam.

In addition, the trainees were taken on an educational tour to important places of agricultural interest, viz., Agricultural Research Stations, Aduthurai, Ambasamudram, Kovilpatti, Sugarcane Research Stations at Gudiyattam and Cuddalore, Poultry Research Station, Co-operative Milk Supply Union at Madras, Sewage Farm at Madurai and the Cattle Farm at Palayakottai. The course came to a close on 14th February 1960.

(vi) *Refresher Course for Extension Officers.*—During the Refresher Course for Extension Officers conducted, lectures were given for four batches on 14th November 1959, 15th December 1959, 17th January 1960 and 9th February 1960.

(vii) *Short courses.*—The short course in agriculture and allied subjects could not be run during the past three years, i.e., 1957-58, 1958-59 and 1959-60 due to the increased admissions to the B.Sc. (Agriculture) Degree Course and for want of sufficient accommodation in the hostel.

(viii) *Students tour.*—The students of B.Sc. (Agriculture) classes were taken on tour to study the agricultural practices in vogue at different centres within the State as well as outside the State as explained below :—

The second year B.Sc. (Agriculture) students were taken on an educational tour from 7th to 24th December 1959 to the following places :—

- (i) Agricultural Research Station, Tindivanam.
- (ii) Agricultural Research Station, Aduthurai.
- (iii) Agricultural Research Station, Kovilpatti.
- (iv) Agricultural Research Station, Ambasamudram.
- (v) Central Sugarcane Research Station, Cuddalore.
- (vi) Sugar Factory, Nellikuppam.
- (vii) Municipal Sewage Farm, Madurai.
- (viii) Municipal Compost Yard, Madurai.
- (ix) Fruit Farm, Kanyakumari.
- (x) State Seed Farm, Tirupatheswaram.
- (xi) Private estates, Kanyakumari district.

The students acquainted themselves with the research work carried on in the different Agricultural Research Stations and also the local agricultural practices in the tracts.

The final year students were taken on tour from 15th January to 4th February 1960 and visited Erode, Palayakottai, Hosur, Bangalore, Katpadi, Madras, Tirurkuppam, Cuddalore and Aduthurai. During the course of the tour, the students acquainted themselves with agricultural practices, animal husbandry problems dairy and poultry farming, etc. The Khariff campaign was inaugurated on 14th October 1959 and the final year students were taken to places, viz., Coimbatore, Pollachi and Udumalpet to participate in the intensive campaign during 15th to 21st October 1959.

(ix) *Special lectures.*—The first year B.Sc. (Agriculture) students were given four special lectures by the Agricultural Meteorologist, Coimbatore. For the second B.Sc. (Agriculture) students, the Crop Specialists delivered in all sixteen lectures on different crops, each specialist taking four lectures. A special lecture on "Farm forestry" was delivered by a staff member of the Forest College. The Statistical Assistant gave ten lectures on statistics. The final year students of the B.Sc. (Agriculture) class had two lectures by the Poultry Development Officers, Madras.

(x) *Gardeners' course.*—The course for training of young men as gardeners was commenced in November 1959 and concluded in April 1960. In all 37 trainees successfully underwent the course during the period and were awarded the certificate of competency in practical horticulture.

(xi) *Scholarships.*—During the year under report, the following scholarships and concessions were granted :—

(1) *State Government Scholarships.*—(a) Eleven Government scholarships available to the Scheduled Castes and Backward Classes for the year 1959-60 were sanctioned by Government at Rs. 30 per mensem for each.

(b) Three (Merit State Government Scholarships at Rs. 30 each per month were also granted during the year.

(2) *Scholarships granted by the Harijan Welfare Department.*—Fresh award of residential scholarships was granted to 75 students while renewal of scholarships was granted to 45 students by the Harijan Welfare Department as per the details furnished below :—

**A. (i) Fresh award to 75 students of Backward Community in B.Sc. (Agriculture) Class for 1959-60.**

|                                                                                         |                        |          |
|-----------------------------------------------------------------------------------------|------------------------|----------|
| (a) Number of scholarships granted to Backward Class students of I.B.Sc. (Agriculture). | 1 at Rs. 281.13        |          |
|                                                                                         | 2 at Rs. 283.39 each.  |          |
|                                                                                         | 1 at Rs. 285.65        |          |
|                                                                                         | 1 at Rs. 287.90        |          |
|                                                                                         | 1 at Rs. 299.19        |          |
|                                                                                         | 10 at Rs. 307.10 each. |          |
|                                                                                         | 1 at Rs. 305.97        |          |
|                                                                                         | 13 at Rs. 315.00 each. |          |
|                                                                                         | 1 at Rs. 450.00        | 9,642.62 |

**A. (i) Fresh award to 75 students of Backward Community in B.Sc. (Agriculture) Class for 1959-60—cont.**

|                                                                                               |           |                                          |                  |
|-----------------------------------------------------------------------------------------------|-----------|------------------------------------------|------------------|
| (b) Number of scholarships granted to Backward Class students of II B.Sc. (Agriculture).      | 25        | at Rs. 315.00 each                       | 7,875.00         |
| (c) Number of scholarships granted to Backward Class students of III B.Sc. (Agriculture).     | 9         | at Rs. 525.00 each                       |                  |
|                                                                                               | 1         | at Rs. 339.84                            | 5,589.84         |
| <b>Total ..</b>                                                                               | <b>66</b> |                                          | <b>23,107.46</b> |
| <b>(ii) Scheduled Castes—</b>                                                                 |           |                                          |                  |
| (a) Number of scholarships granted to eligible community students of I B.Sc. (Agriculture).   | 3         | 2 at Rs. 438.71 each.<br>1 at Rs. 450.00 | 1,327.42         |
| (b) Number of scholarships granted to eligible community students of II B.Sc. (Agriculture).  | 3         | 3 at Rs. 450.00 each                     | 1,350.00         |
| (c) Number of scholarships granted to eligible community students of III B.Sc. (Agriculture). | Nil       |                                          |                  |
| <b>Total ..</b>                                                                               | <b>6</b>  |                                          | <b>2,677.42</b>  |
| <b>(iii) Criminal Tribes—</b>                                                                 |           |                                          |                  |
| (a) Number of scholarships granted to ex-Criminal Tribes students of I B.Sc. (Agriculture).   | 2         | 2 at Rs. 450.00 each.                    | 900.00           |
|                                                                                               | 1         | 1 at Rs. 450.00                          | 450.00           |
| <b>Total ..</b>                                                                               | <b>3</b>  |                                          | <b>1,350.00</b>  |

**B. Renewals to 45 students in B.Sc. (Agriculture) Course for 1959-60.**

|                                                                                               |    |                                                                                 |                 |
|-----------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------|-----------------|
| (i) (a) Number of scholarships granted to Backward Classes students of I B.Sc. (Agriculture). | 19 | 16 at Rs. 315.00 each.<br>1 at Rs. 450.00<br>1 at Rs. 285.85<br>1 at Rs. 283.39 | Rs.<br>6,059.04 |
| (b) Number of scholarships granted to Backward Classes students of II B.Sc. (Agriculture).    | 8  | 8 at Rs. 315.00 each.                                                           | 2,520.00        |
| (c) Number of scholarships granted to Backward Classes students of III B.Sc. (Agriculture).   | 11 | 11 at Rs. 350.00 each.                                                          | 3,850.00        |
|                                                                                               | 38 |                                                                                 | 12,429.04       |
| ii (a) Number of scholarships granted to eligible community of I B.Sc. (Agriculture).         | 2  | 1 at Rs. 469.35<br>1 at Rs. 500.00                                              | 969.35          |
| (b) Number of scholarships granted to eligible community of II B.Sc. (Agriculture).           | 1  | 1 at Rs. 500.00                                                                 | 500.00          |
| (c) Number of scholarships granted to eligible community of III B.Sc. (Agriculture).          | 2  | 2 at Rs. 500.00 each                                                            | 1,000.00        |
|                                                                                               | 5  |                                                                                 | 2,469.35        |

**B. Renewals to 45 students in B.Sc. (Agriculture) Course for 1959-60—cont.**

|                                                                               |    |                      |          |
|-------------------------------------------------------------------------------|----|----------------------|----------|
| (iii) (a) Number of scholarships granted to ex-Criminal Tribes I B.Sc. (Ag.). | .. | ..                   | ..       |
| (b) Number of scholarships granted to ex-Criminal Tribes II B.Sc. (Ag.).      | .. | ..                   | —        |
| (c) Number of scholarships granted to ex-Criminal Tribes III B.Sc. (Ag.).     | 2  | 2 at Rs. 525.00 each | 1,050.00 |
|                                                                               | 2  |                      | 1,050.00 |

*Refund of examination fees.*—Refund of examination fees was also sanctioned in respect of ten students of this college as per the details furnished below :—

**(i) Eligible communities—**

|                              |    |                     |              |
|------------------------------|----|---------------------|--------------|
| I B.Sc. (Ag.) Class students | .. | 4 at Rs. 40.00 each | Rs. 160.00   |
| II Do.                       | .. | 4 at Rs. 50.00      | „ Rs. 200.00 |
| III Do.                      | .. | 1 at Rs. 60.00      | „ Rs. 60.00  |

**(ii) Ex-Criminal Tribes—**

|                                  |    |                |           |
|----------------------------------|----|----------------|-----------|
| Final B.Sc. (Ag.) Class students | .. | 1 at Rs. 60.00 | Rs. 60.00 |
|----------------------------------|----|----------------|-----------|

**(3) Government of India Scholarships.**—The Director of Harijan Welfare, Madras, has also sanctioned fresh scholarships to 5 students and renewals to 13 students of B.Sc. (Agriculture) Classes at varying rates as shown below under Government of India scholarships to Scheduled Castes, Scheduled Tribes and other Backward Classes.

**A. Fresh award to five students in B.Sc. (Ag.) Class—**

|                                                                          |    |                                        |          |
|--------------------------------------------------------------------------|----|----------------------------------------|----------|
| (a) Number of fresh scholarships sanctioned to I B.Sc. (Ag.) students.   | 4  | { 3 at Rs. 550.00<br>1 at Rs. 500.00 } | 2,150.00 |
| (b) Number of fresh scholarships sanctioned to II B.Sc. (Ag.) students.  | 1  |                                        | 550.00   |
| (c) Number of fresh scholarships sanctioned to III B.Sc. (Ag.) students. | .. |                                        | ..       |
|                                                                          | 5  |                                        | 2,700.00 |

**B. Renewals to 13 students in B.Sc. (Ag.) Class—**

|                                                                           |    |                    |              |
|---------------------------------------------------------------------------|----|--------------------|--------------|
| (a) Number of renewal of scholarships granted to I B.Sc. (Ag.) students.  | .. |                    |              |
| (b) Number of renewal of scholarships granted to II B.Sc. (Ag.) students. | 12 | at Rs. 550.00 each | Rs. 6,600.00 |

**B. Renewals to 13 students in B.Sc. (Ag.) Class—cont.**

|                                                                            |   |        |
|----------------------------------------------------------------------------|---|--------|
| (c) Number of renewal of scholarships granted to III B.Sc. (Ag.) students. | 1 | 550-00 |
|----------------------------------------------------------------------------|---|--------|

|    |          |
|----|----------|
| 13 | 7,150-00 |
|----|----------|

(4) *Refund of examination fees and other charges.*—Sanction of examination fees and other charges was also accorded to these students and the details of such sanction are also furnished below :—

|                                                                                                 |             |          |
|-------------------------------------------------------------------------------------------------|-------------|----------|
| i)(a) Government of India Scholarships examination and other charges I B.Sc. (Ag.).             | 4 students  | 304-00   |
| (b) Government of India Scholarships examination and other charges II B.Sc. (Ag.).              | 1 student   | 139-00   |
| ii) (a) Renewal of Government of India Scholarship examination fees and other charges, II year. | 12 students | 1,380-00 |
| (b) Renewal of Government of India Scholarship examination fees and other charges, III year.    | 1 student   | 82-00    |
|                                                                                                 |             | 1,905-00 |

(5) *Other concessions.*—During the period under report 50 students enjoyed full fee concessions under Madras Education Rule 92 and two students were allowed full fee concessions as per G.O. No. 1379, Education, dated 13th August 1957, under Educational Concessions to Children of Political Sufferers while 125 students enjoyed the half fee concessions. The particulars are also furnished below :—

|                          |    |    |    | Concessions. |           |
|--------------------------|----|----|----|--------------|-----------|
|                          |    |    |    | Full.        | Half fee. |
| I B.Sc. (Ag.) students   | .. | .. | .. | 28           | 57        |
| II B.Sc. (Ag.) students  | .. | .. | .. | 23           | 43        |
| III B.Sc. (Ag.) students | .. | .. | .. | 10           | 25        |
|                          |    |    |    | 61           | 125       |

The particulars of the value of scholarships granted are furnished below :—

| Name of the scholarships.                                                 | Number of students. | Amount. |           |
|---------------------------------------------------------------------------|---------------------|---------|-----------|
| (1)                                                                       | (2)                 | (3)     | (4)       |
|                                                                           |                     | RS.     | NP.       |
| <b>Harijan Welfare Scholarships—</b>                                      |                     |         |           |
| 1 State Government Scholarships by Harijan Welfare Department, Madras.    | Fresh ..            | 75      | 27,554-88 |
|                                                                           | Renewal             | 45      | 15,508-35 |
| 2 Government of India Scholarships by Harijan Welfare Department, Madras. | Fresh ..            | 5       | 3,143-00  |
|                                                                           | Renewal             | 13      | 8,612-00  |
|                                                                           |                     |         | 11,755-00 |

| Name of the scholarships.                                                                            | Number of students.                      | Amount.  |                   |
|------------------------------------------------------------------------------------------------------|------------------------------------------|----------|-------------------|
| (1)                                                                                                  | (2)                                      | (3)      | (4)               |
|                                                                                                      | BOYS.                                    | RS.      | NP.               |
| <b>Merit Scholarship Fellowship and other scholarships—</b>                                          |                                          |          |                   |
| 1 State Government Merit Scholarship.                                                                | 3                                        | ..       | 1,080-00          |
| 2 State Government (Food and Agricultural Department).                                               | 11                                       | ..       | 3,960-00          |
| 3 Government of India Scholarships under "Colombo Plan" by Government of India, New Delhi.           | For foreigners in M.Sc. (Ag.) students 4 | ..       | 5,895-00          |
| 4 Government of India Scholarships Fellowship by Indian Council of Agricultural Research, New Delhi. | for M.Sc.(Ag.) Students 5                | 8,230-00 | 9,430-00          |
|                                                                                                      | 1                                        | 1,200-00 |                   |
| 5 Endowment Scholarships "Dr. S. Rangachary's Technical Scholarships".                               | 1958-59                                  | ..       | 150-00            |
|                                                                                                      | 1                                        | 1959-60  | 150-00            |
| 6 Pondicherry State Scholarship                                                                      | 2                                        | 1959-60  | 728-00 } 1,441-00 |
|                                                                                                      |                                          |          | 713-00 }          |
| Private.                                                                                             |                                          |          |                   |
| 7 Sri Tiruvengadathu Chetty's Estate Scholarships.                                                   | 2                                        | ..       | 288-00            |
| 8 Mandya District Board Scholarship                                                                  | 1                                        | ..       | 59-75             |

(xii) *Examinations*—(1) *College Terminal Examinations.*—During the period under report two college terminal examinations in respect of the First, Second and Final year B.Sc. (Ag.) Classes were held during the months as shown below :—

| Class.                        | Month in which held         |                                           |
|-------------------------------|-----------------------------|-------------------------------------------|
|                               | First terminal examination. | Second terminal examination. (Selection.) |
| (1)                           | (2)                         | (3)                                       |
| First year B.Sc. (Ag.) Class  | October 1959                | December 1959.                            |
| Second year B.Sc. (Ag.) Class | Do.                         | Do.                                       |
| Final year B.Sc. (Ag.) Class  | September 1959              | Do.                                       |

Out of 184 students of 1 year B.Sc. (Ag.) Class 1959-60 one was detained since his performance was poor while the remaining 183 students were permitted to appear for the I.B.Sc. (Ag.) University Examination held in April 1960.

Out of 164 students of II B.Sc. (Ag.) Class 1959-60 five students were detained since they were ineligible to appear for II B.Sc. (Ag.) University Examination due to non-completion of the reference subjects in the supplementary First B.Sc. (Ag.) University Examinations held in October 1959. Hence only 161 students were selected and sent up for II year B.Sc. (Ag.) University Examinations held in April 1960.

Regarding the final B.Sc. (Ag.) Class 1959-60 all the 143 students were permitted to appear in the final B.Sc. (Ag.) University Examination held in May 1960.

(xiii) *University Examinations.*—The University Examinations in respect of first and second B.Sc. (Ag.) Classes were held in April 1960 while the same in respect of the final year B.Sc. (Ag.) was held in May, 1960. Besides these, supplementary University Examinations for the first, second and final year B.Sc. (Ag.) Classes were held in October 1959.

The details of the results of the University Examinations held in April 1960, are furnished below :—

| Examinations.                       | Number of candidates registered for the examination. | Number of candidates appeared for the examination. | Number of successful candidates including students with reference permitted to sit in the next higher class. | Percentage. |
|-------------------------------------|------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------|
| (1)                                 | (2)                                                  | (3)                                                | (4)                                                                                                          | (5)         |
| First B.Sc. (Ag.) Examination.      | 195                                                  | 195                                                | 100                                                                                                          | 52          |
| Second B.Sc. (Ag.) Examination.     | 162                                                  | 157                                                | 85                                                                                                           | 54          |
| Final year B.Sc. (Ag.) Examination. | 143                                                  | 143                                                | 100                                                                                                          | 76          |

The results of the supplementary examination held in October 1959, are furnished below :—

| Examination.                    | Number of candidates registered for the examination. | Number of candidates appeared for the examination. | Number of successful candidates. | Percentage. |
|---------------------------------|------------------------------------------------------|----------------------------------------------------|----------------------------------|-------------|
| (1)                             | (2)                                                  | (3)                                                | (4)                              | (5)         |
| First B.Sc. (Ag.) Examination.  | 111                                                  | 111                                                | 100                              | 91          |
| Second B.Sc. (Ag.) Examination. | 58                                                   | 58                                                 | 57                               | 98          |
| Final B.Sc. (Ag.) Examination.  | 33                                                   | 33                                                 | 33                               | 100         |

(xiv) *College Board.*—The Board met 16 times during the period and discussed the results of the College Terminal Examinations, holidays, proposals connected with the education tours of students, syllabus and other subjects connected with education.

The following are the most important subjects which were considered and finalised :—

(i) Resolution of the Board of Studies in Agriculture to conduct the intensive farm training in agriculture to the students of the Final B.Sc. (Ag.) Class after completion of the course.

(ii) The revision of syllabus for I, II and III year B.Sc. (Ag.) Classes as a consequence of the introduction of pre-professional course in Agriculture.

(iii) The integration of pre-professional course in Agriculture with B.Sc. (Ag.) degree course.

(xv) *Intensive practical farm training.*—As per the syllabus prescribed recently by the Registrar, University of Madras, in his letter No. 45/60/A2962, dated 22nd July 1960, the final year B.Sc. (Ag.) Class 1959-60 underwent intensive practical farm training in Agriculture from 15th June to 31st July 1960 under the Extension Specialist in collaboration with Agronomist and Associate Professor of Agronomy.

(xvi) *College Hostel—Staff.*—The hostel section remained under the control of the Principal up to 31st May 1960 and of the Associate Dean from 1st June 1960 and Ex-Officio Warden, assisted by two Gazetted Officers (one in charge of the old hostel and another in charge of the new hostel), Sri S. Muthuswamy, Lecturer in Horticulture, continued as Senior Deputy Warden of the old hostel throughout the year and also of the new Hostel up to 17th February 1960 when Dr. S. Krishnaswamy, Associate Professor of Animal Husbandry, appointed as Senior Deputy Warden for the new hostel assumed charge. The post of Junior Deputy Warden was kept unfilled. Besides, the Senior Steward and Junior Steward sanctioned by the Government, the Hostel Steward in charge of Stores and the Canteen Steward, paid out of hostel funds continued to function throughout the year.

*Accommodation and strength.*—The old Nirmala College Building taken on rent at R.S. Puram, for accommodating the first year students, was vacated on 25th June 1959, and therefore all the students had to be accommodated in the main hostel itself, pending the completion of construction of the new hostel building.

The new hostel building was formally opened by Hon'ble Chief Minister to the Government of Madras on 13th September 1959, in the distinguished presence of the Minister for Home and Agriculture of Madras. The new hostel consists of 138 double rooms (including visitors rooms, recreation rooms, infirmary rooms, etc.), and is provided with all modern amenities such as shower bath and flushouts. Accommodation was provided in the ground floor and first floor of the new hostel for all the first years and a few second years and in the second floor for all the M.Sc. (Ag.) students. The second and third year students were accommodated in the old hostel blocks. Nineteen young farmers trainees who underwent the six months course were also accommodated in the recreation rooms of the new hostel and dining halls of the old hostel for want of accommodation. Departmental officers attending the conferences, parties of farmers, gramasevaks, etc., were also accommodated and a total sum of Rs. 2,446.46 was recovered as rent and remitted into Central Office.

The College re-opened after summer vacation for B.Sc. (Ag.) Course on 15th June 1960. The strength of the Hostel at the beginning of the year (1959-60) was 438. With addition of Post Graduate students admitted for the second year and admission of 184 students for the first-year B.Sc. (Ag.) the effective strength as on 30th June 1960 (both in the old and new hostels) was 584 comprising the following :—

| year.                         | Hostelers. | Day scholars. | Total. |
|-------------------------------|------------|---------------|--------|
| Final year (Farm trainees) .. | 128        | 16            | 144    |
| First year .. .. .            | 107        | 22            | 129    |
| Second year .. .. .           | 156        | 27            | 183    |
| Final year .. .. .            | 134        | 20            | 154    |
| M.Sc. (Ag.), First year ..    | 27         | 11            | 38     |
| M.Sc. (Ag.), Second year ..   | 32         | 7             | 39     |
| Total ..                      | 584        | 103           | 687    |

Consequent on the decision to give farm training to the final years of 1959-60, accommodation was given to the farm trainees in the hostel from 16th May 1960 up to 30th July 1960, when the training was officially completed. There were two students from Ceylon and one from Indonesia in the Graduate course and one from Nepal and two from Thailand in the Post-Graduate Course in the Hostel.

**Ladies' Hostel.**—There were eleven students in the ladies' hostel at the end of the year. Since the existing C type quarters (C. 10) was quite inadequate to accommodate all the eleven students, it was proposed to have one more additional quarter adjoining the existing quarters.

**Messes.**—At the main hostel, there were two non-vegetarian messes and two vegetarian messes out of which one vegetarian mess was working on a fixed rate basis, managed by a contractor. One vegetarian mess and one non-vegetarian mess were opened in the new hostel from 5th November 1959. The messes are run with the help of the student representatives who are associated in all aspects of running the messes. The average strength of the messes and daily rates for the year were as follows :—

| Name of the messes.                       | Average strength. | Daily rate. |
|-------------------------------------------|-------------------|-------------|
|                                           |                   | RS. NP.     |
| (a) Vegetarian mess (old hostel) ..       | 90                | 1 25        |
| (b) Non-vegetarian mess A (old hostel) .. | 78                | 1 45        |
| (c) Non-vegetarian mess B (old hostel) .. | 106               | 1 41        |
| (d) Contract mess (old hostel) ..         | 67                | 1 31        |
| (e) Vegetarian mess (new hostel) ..       | 48                | 1 27        |
| (f) Non-vegetarian mess (new hostel) ..   | 123               | 1 41        |

With a view to run the messes on economic lines supply of evening tiffin was stopped from 1st November 1959 and instead the students' canteen (coffee section) was strengthened by supply of savouries and sweets in the evening to a limited extent and the canteen was allowed to function between 3 p.m. and 6 p.m. on all days. The system of credit supply of coffee and eatable to the students through coupons was also introduced in the canteen this year. Fresh tenders were called for running the contract mess and also for supply of kitchen establishment for the students' messes for the academic year 1960-61.

**Health.**—The general health of the inmates of both the hostels remained normal, except for sporadic cases of chicken pox. Prophylactic measures were immediately taken to prevent the spread of the infection, by vaccination of all the inmates. Medical examination of all the students by the doctors of the Government Headquarters Hospital, Coimbatore, was also conducted. Dr. T. S. Veeraraghavan of the Lawley Road Dispensary continued as the Medical Officer for the hostel during the entire period. The Control over the nursing orderly of the Isolation Ward was transferred from the Sanitary Inspector to the Senior Deputy Warden of the Hostel. The Medical Room of the hostel was strengthened by purchase of costly drugs and other requisites to the tune of Rs. 200 from out of the Medical Amenities Fund.

**Stores, provisions and vegetables.**—Provisions and other articles, such as eggs, mutton, fish, fowl and plantain leaves and bakery materials required for the messes were continued to be purchased through tender system, after collecting security deposits from the suppliers. The tenders are renewed every six months. The provisions and other articles were continued to be delivered at the hostel free of transport and incidental charges. The vegetable requirements for the hostel are also delivered at the hostel premises free of transport by the vegetable suppliers and bills are settled on the strength of the certificates of the mess representatives in charge. The student representatives continued to purchase vegetables for the messes once in a week to verify the local market rates for comparing the rates of the contractors' bills. The total cost of provisions and vegetables purchased and consumed in the students' messes during the period was as follows :—

|                      | RS.    | NP. |
|----------------------|--------|-----|
| 1 Provisions .. .. . | 76,464 | 60  |
| 2 Vegetables .. .. . | 25,876 | 65  |
| 3 Milk .. .. .       | 30,478 | 15  |
| 4 Fuel .. .. .       | 8,870  | 76  |

**Canteen.**—The students' canteen caters to the needs of the students in respect of stationery articles, note books and other essential items required for studies as well as to supply of coffee and estates. The canteen is working on 'No profit—No loss'

basis. The total outturn in the canteen (both coffee and stationery section) for the period from 1st July 1959 to 30th June 1960 was to the tune of Rs. 47,845-25.

*Water-supply and sanitation.*—The scavenging staff of the Sanitary Section were regularly attending to their duties. Siruvani water required for drinking and cooking purposes in the messes and also for the blocks were brought daily through the Central Farm carts, while the supply of water for bathing and washing purposes for the old and new hostels were made from well No. 68 by pumping and storing in overhead tanks to which water is pumped through electric motor installed in the new hostel premises.

*Other amenities to the students.*—The following may be mentioned among the amenities provided during the year :—

(i) Tube lights were renewed in the blocks and messes of the old hostel.

(ii) The washermen, dry cleaners and others who are frequent visitors to the hostel were given printed pass cards with a view to prevent the entry of unauthorized persons.

(iii) The block boys were supplied with badges and uniforms for easy identification by the students and visitors.

(iv) The electrical rewiring of the blocks I to X of the old hostel (including attached messes and dining halls) was carried out and completed.

(v) The old and wornout pipes in all the bathrooms in the old hostel were replaced and fresh taps provided.

(vi) Wiremesh netting was provided for the rear windows in long block rooms.

(vii) One hundred and two steel folding chairs were purchased out of hostel funds to be used for students' function in the hostel and college.

*General.*—Pongal Day was celebrated on 14th January 1960 by the students in the new hostel on a grand scale under the distinguished presidentship of Dr. M. S. Randhawa, I.C.S., Vice-President, Indian Council of Agricultural Research, New Delhi. The Annual Hostel Day was celebrated on 5th March 1960 in the old hostel premises under the Presidentship of Dr. S. Krishnamurthy, Dean and Additional Director of Agriculture. Sri G. D. Naidu, Industrialist and a prominent citizen of Coimbatore, was the chief guest. Prizes were awarded to the hostel staff, mess establishment and students and the total expenditure incurred out of hostel funds for the function was Rs. 542-22.

*Film show.*—The fortnightly film show was inaugurated by the Principal on 16th January 1960. Sixteen mm. films were obtained from Film Distributors and Film Distribution Companies and exhibited on alternate Fridays. Educational films on agricultural subjects were also exhibited along with the feature films.

(xvii) *Students' club.*—The Principal is the Ex-Officio President of the Students' Club. All the students were members of the Club.

The year under review was a good one as far as games and sports were concerned. All the games were played regularly.

Facilities for the following games are available :—

- |               |                  |
|---------------|------------------|
| (1) Football. | (5) Volley Ball. |
| (2) Hockey.   | (6) Basket Ball. |
| (3) Cricket.  | (7) Badminton.   |
| (4) Tennis.   | (8) Ring Tennis. |

There are two indoor games rooms. One more table tennis table was bought during the year making the total to two. Because of the increased number of students, the space for the indoor games is not sufficient.

The College Day sports was held on 16th September 1959 and Sri P. R. Ramakrishnan, M.P., and Principal, Coimbatore Institute of Technology presided.

The students of this College competed in the league matches, the University tournaments and all the local tournaments. In the University tournaments, the students won the divisional championship in badminton for the second year in succession. In the divisional sports meet this college narrowly missed the championship. One of our students, Sri Gopalakrishna Shenova represented the Madras University in the University sports meet. In the Coimbatore inter Collegiate Athletic Association sports meet this college annexed the Rama Renganathan Shield for the Championship.

This College competed in the Government Arts College tournaments and won the following trophies :—

- (1) Hockey Cup.
- (2) Badminton Cup.
- (3) Tennis Doubles cup.

This College also competed in the Government Victoria College Tournaments and knocked off the following cups :—

- (1) Basket Ball Cup.
- (2) Tennis Singles Cup.
- (3) Tennis Doubles Cup.

(xviii) *Library*—New additions to the library.—A total number of 1,192 books and 2,804 current issues of periodicals were added to the library during the year as against 503 books and 3,493 current issues of periodicals in the corresponding period of last year. Besides these, 81 annual reports and 1,432 bulletins were also added to the library during the year.

*Technical Co-operation Mission Programmes.*—A total number of 534 books was received under the Technical Co-operation Mission Programme.

A total number of 71 Indian periodicals, 67 British periodicals, 56 American periodicals and 16 foreign periodicals were purchased during the year and an amount of Rs. 8,000 allotted for this purpose was fully utilized.

The following new periodicals have been subscribed for the library :—

- (1) Annual review of Plant Physiology.
- (2) Annual review of Entomology.
- (3) Annual review of Microbiology.
- (4) Biological Bulletin.
- (5) Biometrics.
- (6) Journal of Cellular and Comparative Physiology.
- (7) Journal of American Oil Chemical Society.
- (8) Genetica.
- (9) Japanese Journal of Genetics.
- (10) Netherlands Journal of Agricultural Journal.
- (11) Plant and Soil.
- (12) Bulletin of the Botanical Survey of India.
- (13) Indian Poultry Gazette.
- (14) Indian Potato Journal.
- (15) Indian Journal of Applied Chemistry.
- (16) March of India.
- (17) Nagpur Agricultural College Magazine.
- (18) Biometrika.
- (19) Discovery.
- (20) Journal of Ecology.

*Loan Service.*—Eight thousand eight hundred and twenty-two books were issued on loan to the Departmental officers both at the Agricultural College and Research Institute, Coimbatore, and outside.

A total number of 2,901 books were issued on loan to the students.

The visitors book has recorded 15,126 readers and a total number of 36,296 books and publications was consulted by them. The library is also being used by the Officers of the Regional Botanical Survey of India, Coimbatore and the Central Sugarcane Breeding Institute, Coimbatore.

*Cataloguing.*—A total number of 3,106 author cards 3,106 subject cards and 985 series cards were prepared.

*Binding.*—A total number of 550 books and periodicals have been bound during the period under report.

*Shelf Register cards.*—The shelf register cards are being prepared for all the volumes in the library.

*Abstract service.*—The service of abstracting and classification of important articles on current literature for the benefit of officers who have no easy access to the library was continued during the year. A total number of 357 abstract materials were issued during the period under report.

*Circulation of magazines.*—A total number of 1,400 loose issues of periodicals was circulated among the heads of sections at Coimbatore.

(xix) *College Museum.*—The College Museum continued to be a centre of attraction to visitors. The total number of visitors to the Museum during the period under report was 40,311. The visitors mostly comprised of parties of Professors of various colleges and teachers of high schools, etc., with students.

(xx) *Central Exhibition.*—The Central Exhibition of the Agricultural College and Research Institute, Coimbatore is also a centre of attraction to various visitors of this country as well as to the visitors from abroad. During the period under report, 94 distinguished visitors from abroad as well as in this country have visited the Central Exhibition and they have recorded very good remarks. The total number of visitors to the Central Exhibition during the year was 18,989.

(xxi) *College Estate—College Estate Committee.*—The Committee met almost every month to consider the measures for improving sanitation and amenities. Sri K. S. Shetty, Assistant Lecturer in Chemistry and Sri L. Vadivelu, Librarian, continued to be the representatives of the Estate Residents. During the year under report the Committee met twelve times.

*Sanitations.*—The Estate Sanitary branch is attached to the Civil Engineering Section. The maintenance of the Sanitation of the estate as well as hostels and rest-house was very satisfactory. The mosquito control squad attended to spraying work periodically in the cess pools, drains, etc., against the mosquitoes and also against the flies in the hostel messes.

*Mosquito control.*—There are one Field Assistant and one spray man engaged in this work. They were attending to the spraying in all types of mosquito breeding places. It was found necessary to intensify this scheme consequent on the construction of New Hostel, Jubilee Building, Post-graduate building, etc. As such, proposals were submitted for engaging two more spraymen

under this scheme. The Government have accorded sanction for these posts and the intensified programme has also been extended to Millets, Cotton and Paddy Stations.

Under the National Malaria Eradication programme DDT spraying was done for all the quarters in the Estate during this year.

*Prevalence of infectious diseases.*—There were nine cases of Chicken pox reported during the year. All the cases were secluded from the public and necessary preventive measures taken in time. As there was smallpox cases found around the College Campus (villages like Poojaripalayam, Pudur, etc.), about 1,200 re-vaccinations and thirty-five primary vaccinations were done during the year.

*Vital Statistics.*—There were sixteen births and ten deaths reported and registered respectively.

*Rest House.*—The rest house was maintained very satisfactorily during the year. In all 204 visitors had stayed in the Rest House during the period under report and Rs. 554.88 was collected as rent from them.

(xxii) *Civil Engineering Section.*—The section is mainly intended for teaching but it also attends to the petty constructions and repairs to all the buildings on the estate.

*Teaching.*—During the period under report 110 hours of theory classes and 638 hours of practical classes were conducted.

*Works.*—There are about 400 residential and non-residential buildings and also the roads of eight miles length in the college estate which are to be properly maintained. Hence the Civil Engineering section has to maintain these and to attend to the work of petty construction and repairs relating to (1) Works pertaining to non-residential buildings and roads (2) works pertaining to residential buildings and (3) works pertaining to other sections.

During the period under report 104 estimates for annual repairs and special repairs to residential and non-residential buildings and also for repairs to road and to a few original works were prepared, while 40 estimates which were received from outside stations were scrutinised and sent back for sanction of Director of Agriculture. During the period under report 256 bills were prepared for making payment for the works completed and arrangements were made for payment.

Main items of work attended to during the year is given below :—

(1) The construction of a gas producer house for Assistant Agricultural Engineer (Mechanical) section at an estimated cost of Rs. 9,000 was taken up in February 1960 and is in progress.

(2) The construction of one Thotties quarters was started and completed at a cost of Rs. 2,095.

(3) The construction of a green house for oilseeds was completed at an estimated cost of Rs. 25,000 during the year.

(4) Providing a leaned roof shed on the western side to Research Engineer's workshop.

(5) The construction of leaned roof on rear side of Cholam laboratory.

(6) Metalling the Robertson Road up to Gate.

(7) Improvement and Special repairs to implement shed and cart stand in Paddy Breeding Station.

(8) Providing flush-out connection to F type quarters 21 to 30.

(9) Construction of screen wall alround new pumphouse of A block well and providing drains and cisterns for the same.

(10) Constructing a revetment for Robertson Road.

(11) Special repairs to Orchard well.

(12) Provision of expanded metal for rear windows in long block.

(13) Metalling the road from Hostel block 10-11.

(14) Construction of a verandah in Cumbu laboratory.

(15) Constructing an implements-cum-packing shed.

(16) Provision of smokeless chimney and sanitary installations to A grade Bungalow No. 1.

(xxiii) *Mechanical Engineering Section.*—The section continued to be in charge of teaching for II B.Sc. (Ag.) Class and also maintenance of electric and water-supply installation in the estate, gas supply to the laboratories and maintenance of college buses.

The construction of a second gas house at a cost of Rs. 9,500 has been taken up and is proceeding apace. This will house three gas producer units which have already been purchased.

An estimate for Rs. 63,000 for the construction of a 20,000 gallon capacity water reservoir has been prepared and submitted for consideration under Part II Schemes for the year 1960-61. This additional water reservoir has become an absolute necessity as the estate has in recent years expanded considerably, not to mention the increased demands from the new Golden Jubilee and Post-Graduate buildings.

#### EDUCATION.

The teaching staff had to shoulder responsibilities which were more than they could undertake themselves, partly because, the posts of Lecturer and Assistant Lecturer remained vacant for nine and five months respectively and partly because of maintaining heavy stores and accounting responsibilities without the requisite staff.



During the year 176 practical classes and 55 lecture classes were given to the students of the second year. They were also taken round the local Engineering College for giving lessons on workshop methods and manufacture of agricultural machines and equipments. Emphasis on pump and electric motor manufacture was special feature this year. One set of (two) Oliver seed drills was taken over from the Assistant Agricultural Engineer (Inspection), Coimbatore, on free transfer. These were utilised for conducting field demonstrations and calibration work.

One student of the second year was awarded the Gupta Memorial Endowment Prize for securing highest marks in the University examinations.

#### WORKS.

(i) *Water-supply*.—A new 15 h.p. Johnson Turbine pump was installed in field No. 72 at a cost of Rs. 11,000. This has a capacity of 10,000 gallons per hour and meets the entire demand of the Estate in terms of water-supply. Another notable feature of this division is the interlinking, for the first time in the annals of this College, of the Estate Hostel, Hospital and Institute water supplies by a 'Grid' ensuring continuity throughout. Failure of water supplies both for the students and the Estate residents which were not uncommon in the previous years have thus become things of the past.

Renewal of estate water lines at a cost of Rs. 138,880 was undertaken by the Public Health Department.

The quarters in the Millets Breeding Station were provided with independent water supply by the construction of an overhead tank of 1,350 gallons capacity and the necessary distribution lines.

(ii) *Electricity*.—The electrical staff of this division look after the lighting and power requirements of nearly 10 miles of roads inside the estate besides 3,000 light points and 104 domestic services. Irrigational needs catered to by 25 pumpsets are also taken care of by these staff members. This is not to mention 14 industrial loads and two D.C. generation units.

The off-take of power consumption has reached a total of 339,454 units for this year which means that it has exceeded the last year's total by 10,804 units. Consequently the current consumption charges for the year amounted to Rs. 28,474 as against Rs. 22,763 last year. These additional loads are due to the commissioning of the New Hostel on 15th July 1959 for 250 students and also the opening of the Golden Jubilee buildings on 29th May 1959. Revision of tariff rates by the Electricity Board from 1st October 1959 also accounts for this enhanced expenditure.

Unlike the other institutions, this has its own distribution transformers and the connected overhead lines and the maintenance thereof is completely in charge of the electrical staff who

number only three in the form of a Supervisor and two women. It is needless, therefore, to mention that the very heavy quantum of work in this estate is borne by a totally inadequate staff pattern which requires to be strengthened suitably were long.

The site test of all the transformer oils for B.D.N. of oil was conducted by the Electricity Board during June 1960 and satisfactory results obtained. The major work of overhauling of No. III transformer at the Cotton Breeding Station was also completed on 9th August 1959.

(iii) *Gas supply*.—During the period there were 51 gas production and a total of 660,400 cubic feet of gas was produced and supplied to the laboratories.

The entire renewal of gas lines for the Chemistry, Mycology and Bacteriology laboratories was taken up and completed at a cost of Rs. 2,100.

Conversion of the existing gas producers from wood firing to oil firing is under consideration at cost of Rs. 25,000. The work is to be taken up on high priority.

To meet the increased demands, an additional low pressure gas holder of 10,000 cubic feet, capacity has been proposed at a cost of Rs. 58,000.

(iv) *Vehicles*.—One bus MDC 9718 which is used as an amenity for the Estate residents and students was maintained by this section satisfactorily.

An old bus MDC 8783 was condemned and sold in public auction after getting Government order.

The van MSY 3808 used by the Dean and Additional Director of Agriculture was also maintained satisfactorily.

#### RESEARCH.

A device to give an alarm and simultaneously switch off power supply to a turbine pump was developed by the staff of the Mechanical section during April 1960. This remote control device functions from a distance of 2,000 feet from the site of installation of the pump without electrical overhead lines. The hydraulic pressure on the pumping main is utilized to trip a deflecting needle in the pressure gauge which short circuits the electric circuit and thereby trips the starter. The waste of water due to overflow from the storage tank is thus controlled.

(xxiv) *Animal Husbandry Section—General*—A total of 1,525 in-patients and 3,449 out-patients were treated during the period under report. The daily average attendance was 82.54. Seven hundred and ninety-eight castrations were performed during the period. A total of 266 major and 35 minor operations were performed during the period under report.

**Contagious disease livestock.**—There was no incidence of contagious disease among livestock during the period.

**Preventive inoculations.**—Three hundred and thirty-two birds were protected against Ranikhet disease by freeze dried Ranikhet vaccine.

Three hundred and twenty-six birds were protected against fowl-pox by pigeon-pox vaccine.

One hundred and ninety-four birds were protected against fowl-pox by fowl-pox vaccine.

Two hundred and fifty-one animals of the various breeding stations were protected against Black quarter.

Eighty-nine bullocks of the various breeding stations were protected against Rinderpest by freeze dried Rinderpest vaccine.

**Laboratory work.**—Six hundred and thirty specimens were examined during the period.

**Visitors.**—Nallasenapathi Sarkarai Manradiar, M.L.C., Pat-taikar of Palayakottai and Dr. T. D. Mantharamurthy, Deputy Director of Animal Husbandry (Veterinary) paid visits to this institution.

**Livestock.**—Health of the livestock at the Central Farm and other Breeding Stations was on the whole satisfactory.

**Bull services.**—Seventy cows were served by Gir bull 13 stationed in the Veterinary Hospital.

#### TEACHING.

One hundred and eleven and 93 classes of one hour each and 368 and 344 classes of practical of 2 hours duration of B.S.C. (Ag.) Class I and II years were conducted respectively during the period.

Artificial Insemination Sub-Centre of the Animal Husbandry Department continued to function. On an average 268 animals are inseminated in this Sub-Centre in a month.

(xxv) **Artists' section.**—There were seven artists working in the Agricultural College and Research Institute, Coimbatore, during the period under report. One of them was the Artist Photographer who attended to photographic work of all sections. All the artists are centralized under the control of the Principal direct. For the administrative convenience as the artists were away from the Central office, the officer nearest to the room, viz., Government Entomologist and Associate Professor of Entomology, was in-charge of the Artists section till 3rd May 1959 but from 4th May 1959 onwards the Extension Specialist is in-charge of that section.

The following items of work were executed during the period :—

|                                  |     |     |     |     |     |       |
|----------------------------------|-----|-----|-----|-----|-----|-------|
| (1) Photographs                  | ... | ... | ... | ... | ... | 469   |
| (2) Prints and enlargements      | ... | ... | ... | ... | ... | 1,272 |
| (3) Development of films         | ... | ... | ... | ... | ... | 227   |
| (4) Retouching and spotting      | ... | ... | ... | ... | ... | 838   |
| (5) Posters                      | ... | ... | ... | ... | ... | 105   |
| (6) Lantern slides and colouring | ... | ... | ... | ... | ... | 239   |
| (7) Planting                     | ... | ... | ... | ... | ... | 68    |
| (8) Sign boards                  | ... | ... | ... | ... | ... | 15    |
| (9) Pen and ink work             | ... | ... | ... | ... | ... | 147   |
| (10) Show cards                  | ... | ... | ... | ... | ... | 436   |
| (11) Plans and layouts           | ... | ... | ... | ... | ... | 24    |
| (12) Labels                      | ... | ... | ... | ... | ... | 2,914 |
| (13) Miscellaneous               | ... | ... | ... | ... | ... | 64    |

Total ... 6,817

(xxvi) **Study group.**—Study group meetings were held almost on all working Saturdays and all members of teaching and Research Staff actively participated in the discussions. During the period 38 meetings were held.

**Board of Honorary visitors.**—The Board met twice on 21st September and 29th December 1959 and considered the remarks of the honorary visitors and recommended appropriate action on them.

**College Day and Conference.**—The Forty-Second College Day and Conference was celebrated from 13th to 16th September 1959. Sri M. Bhaktavatsalam, Minister for Home and Agriculture, presided over the function and Sri K. Kamaraj, Chief Minister of Madras, inaugurated the conference.

(xxvii) **Departmental Officers' Conference.**—The Departmental Officers' Conference was held on 14th September 1959 under the Presidentship of the Secretary, Food and Agriculture Department, Madras, when several matters of interest were discussed in detail. In the afternoon the inaugural meeting of Extension Council was held under the Chairmanship of the Director of Agriculture, Madras, to discuss the progress achieved in the field of Extension.

**Farmers' Day Celebrations.**—The Farmers' Day Celebrations at the Central Farm was conducted on 13th September 1959 under the Chairmanship of the Minister for Home and Agriculture, Madras, Sri M. Bhaktavatsalam, when Sri R. Krishnaswami Naidu addressed the gathering. A special exhibition was organized in the Central Farm at that time.

**Scientific Workers' Conference.**—On 15th September 1959 the Ninth Scientific Workers' Conference was held under the Chairmanship of Sri S. N. Venkataraman, Retired Joint Director of Agriculture, when 17 papers were presented out of which 8 papers were read and discussed.

(xxviii) *College Day Sports*.—On 16th September 1959 the Annual College Day sports were conducted when Sri P. R. Ramakrishnan, M.P., presided while Mrs. P. R. Ramakrishnan distributed the prizes.

(xxix) *Other important events*.—Nil.

(xxx) *Inspections*.—Routine inspections of the College Hostel and the Estate are punctually and regularly done throughout the period under report. Besides these special visits had been paid to artists sections, stores, Laboratories, Dairy, Poultry, Central Farm, Animal Husbandry section, Playground, Students' hostels, various crops breeding stations here at this college as well as orchard vegetable areas, etc.

(xxxi) *Visitors*.—A large number of important and distinguished visitors from the Indian Union as well as from foreign countries had visited the Agricultural College and Research Institute, Coimbatore, during the period under report.

#### IV. SEASON.

(a) South-west monsoon set in over the Madras State on the 6th June 1959. There were scattered or local showers in the State during the first three weeks of the month except on the 5th, 10th, 13th and 14th June 1959, when the weather remained dry. Under the influence of a depression that had formed in the South-west Bay of Bengal on the 21st June 1959, rainfall was fairly widespread over the State on 21st, 22nd and 23rd of the month. The weather remained dry on 24th June 1959, but from 25th June there were scattered or local showers in the State up to the end of the month. Showers were scattered or had occurred locally in the State throughout the first fortnight of July 1959. During the second fortnight there were scattered showers except on 16th, 21st, 22nd, 23rd, 27th and 28th of the month when the weather remained generally dry. During the month of August 1959, the rainfall was scattered over the State except on the 1st, 3rd, 4th, 8th, 20th, 21st, 27th and 28th when the weather was dry. Scattered or local showers occurred in the State up to 27th September 1959 except on 1st, 2nd, 11th and 14th on which days the weather remained dry over the State. Rainfall was fairly widespread on 28th and 29th September 1959. The weather remained dry on 30th day of the month.

The rainfall during the south-west monsoon period extending over June 1959 to September 1959 in the Madras State as a whole was deficient by 16.3 per cent of the normal rainfall. The deficiency in rainfall as compared with the normal range between 20 and 50 per cent in Madras, Chingleput, South Arcot, North Arcot, Tiruchirappalli, Thanjavur and Ramanathapuram districts. It was 7 per cent in Salem district and 8 per cent in Madurai district. The rainfall was in excess of the normal by 10 or 30 per cent in Coimbatore, Tirunelveli and the Nilgiris districts and was 49 per cent in Kanyakumari district.

(b) *North-east monsoon (October 1959 to December 1959)*.—The north-east monsoon set in over the State on 18th October 1959, as a result of which rain or thunder showers occurred continuously up to 22nd October 1959. Under the influence of a low pressure wave that moved westwards across the State, rain or showers were fairly widespread in the State on 23rd and 24th of the month. Under the influence of another low pressure wave which moved westwards across South-west Bay of Bengal rainfall continued to be fairly widespread and locally heavy over the State from 25th to 28th October 1959 after which it was local or scattered over the State, till the close of the month. Rain or thunder showers occurred locally or were scattered in the State up to 6th November 1959, except on the 3rd on which date the weather remained dry. Under the influence of a well-marked trough of low pressure that formed on the 7th over the West Central Bay of Bengal rainfall had been fairly widespread in North Madras State, while the weather remained mainly dry over the South Madras State. Rainfall again commenced on 8th November and lasted till the 14th of the month being scattered or local. Dry weather prevailed over the State for four days from 15th November and the rainfall was intermittent up to 24th November 1959. Rainfall was fairly widespread over the State on 25th and 26th, but the 27th November was practically dry. Under the influence of another depression which formed this time in the South-west Bay of Bengal on 28th November, rainfall was fairly widespread over the State on 28th, 29th and 30th November 1959. The month of December 1959 commenced with fairly widespread rainfall in the State and there was local or scattered rainfall on 2nd and 3rd December 1959. The weather remained generally dry from 4th December 1959 to the end of the month except for scattered or local showers that occurred on 8th, 11th, 12th, 19th to 21st, 28th, 29th and 31st December 1959.

During the north-east monsoon period extending over October to December 1959 the rainfall in the State as a whole was deficient by 3.6 per cent as compared with the normal rainfall. Maximum deviation from the normal occurred in Kanyakumari district where the rainfall was deficient by 45 per cent. The deficiency in rainfall ranged between 10 and 30 per cent in Madras, Chingleput, Thanjavur and Tirunelveli districts. It was below 10 per cent in Tiruchirappalli, Madurai and Ramanathapuram districts. The rainfall was bordering on the normal in the Nilgiris district and slightly above the normal in South Arcot and North Arcot districts. The rainfall was in excess of the normal by 33 per cent and 10 per cent in Salem and Coimbatore districts respectively.

(c) *Winter period (January 1960 and February 1960)*.—Except for the isolated showers that occurred in the South Madras State on the 3rd and 9th January 1960 the weather remained dry in the State up to 19th January 1960. Under the influence of a depression that had formed in the South-west Bay of Bengal

on 20th January rain fall was scattered on 20th January and was fairly widespread on 21st January 1960. Rain or showers were scattered in the State from 22nd to 25th January 1960. The weather remained dry on the remaining days of the month except for scattered or local showers that occurred in the South Madras State on 10th, 11th, 22nd, 23rd, 25th to 27th and 29th February 1960, the weather remained dry over the State during the month of February 1960. The rainfall during the winter period was below the normal in all the districts of the State except Madras where it was normal.

(d) *Hot weather period (March 1960 to May 1960).*—Except for scattered or local rains that occurred on 4th, 8th to 11th and 24th March 1960 the weather remained dry in the State during the month of March 1960. Rain or thunder showers were scattered or local in the State during the month of April 1960 except on 1st, 8th to 13th, 19th, 24th and 27th to 30th of the month, when the weather remained mainly dry. During the month of May 1960 rain or thunder showers occurred locally or were scattered except on 1st, 2nd, 8th, 9th, 13th 23rd to 25th 27th 28th 31st May 1960 when the weather remained dry over the State.

The rainfall during the hot weather period was below the normal in all the districts of the State except Ramanathapuram, Tirunelveli, the Nilgiris and Kanyakumari districts. The excess in rainfall was the highest in Tirunelveli district.

## V. SECOND FIVE-YEAR PLAN—REVIEW OF PROGRESS.

*Targets and Achievements up to 1959-60.*—The following are the targets fixed under the Second Plan and achievements made during the first four years of the plan period :—

| (1)                                           | Five years' target (in tons). | Additional production of food grains (in tons). |             |             |                              |
|-----------------------------------------------|-------------------------------|-------------------------------------------------|-------------|-------------|------------------------------|
|                                               |                               | 1956-57.                                        | 1957-58.    | 1958-59.    | 1959-60 (not yet finalized). |
|                                               | LAKHS.                        | LAKHS.                                          | LAKHS.      | LAKHS.      | LAKHS.                       |
| (2)                                           | (3)                           | (4)                                             | (5)         | (6)         |                              |
| <b>I. Food Grains—</b>                        |                               |                                                 |             |             |                              |
| (i) Major Irrigation .. ..                    | 0.90                          | 0.16                                            | 0.34        | 0.18        | 0.11                         |
| (ii) Minor Irrigation .. ..                   | 1.10                          | 1.18                                            | 0.14        | 0.17        | 0.25                         |
| (iii) Land Development and Soil conservation. | 0.53                          | 0.08                                            | 0.06        | 0.03        | 0.07                         |
| (iv) Fertilizers and manures..                | 6.06                          | 1.38                                            | 0.65        | 0.69        | 1.37                         |
| (v) Improved seeds .. ..                      | 3.90 (—)                      | 0.17                                            | 0.56 (—)    | 0.09        | 0.13                         |
| (vi) Japanese method .. ..                    | ..                            | 0.33                                            | 0.19        | 0.54        | 0.23                         |
| (vii) Plant protection .. ..                  | 0.30                          | 0.09                                            | 0.15        | 0.30        |                              |
| <b>Total ..</b>                               | <b>12.79</b>                  | <b>2.05</b>                                     | <b>2.09</b> | <b>1.82</b> | <b>2.15</b>                  |
| <b>II.</b>                                    |                               |                                                 |             |             |                              |
| (i) Oil seeds .. ..                           | 1.66                          | 0.15                                            | 0.26        | 0.67        | 1.20                         |
| (ii) Sugarcane .. ..                          | 10.00                         | 1.77                                            | 2.37        | 2.17        | 2.00                         |
| (iii) Cotton (Bales) .. ..                    | 1.65                          | 0.32                                            | 0.61        | 0.65        | 0.10                         |

As against the five-year plan provisions of Rs. 468.86 lakhs made for the scheme run by the Agricultural Department a total amount of Rs. 332.00 lakhs (net) has been spent up to March 1960.

The achievements so far have not been quite up to expectations. The shortfalls are largely due to the following factors besides adverse seasonal conditions :—

- (i) Shortage of trained technical personnel.
- (ii) Short supply of ammonium sulphate and other chemical fertilizers.
- (iii) Difficulty in procurement of tractors, spare parts, equipments, etc., due to the revised import policy of the Government of India and the foreign exchange position.
- (iv) Non-availability of labour in season and equipment of schemes.

The following schemes are in operation during the year 1959-1960, under Second Five-Year Plan :—

- (1) State Seed Farm.
- (2) Green manure seeds.
- (3) Scheme on the multiplication and distribution of improved seeds.
- (4) Scheme for control of pests and diseases and plant protection.
- (5) Scheme for purchase and distribution of dusters and sprayers at concession rate.
- (6) Urban compost scheme.
- (7) Scheme for development of local manurial resources.
- (8) Scheme for the development of Night Soil Compost in bigger panchayats.
- (9) Pilot scheme for development of Night Soil Compost in smaller villages.
- (10) Japanese method of paddy cultivation.
- (11) Pilot scheme for destruction of rats.
- (12) Horticultural Development.
- (13) Increasing the production of Oilseeds.
- (14) Cashew Development Scheme.
- (15) Sugarcane Development Scheme.
- (16) Road Development Scheme in the Sugar Factory areas.
- (17) Increasing the production of cotton.
- (18) Scheme for the establishment of a regional coconut Research Station in Thanjavur district.
- (19) Coconut nursery scheme.

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|-----------------------------------------------|-------------------------------|-------------------------------------------------|----------|----------|------------------------------|
|                                               |                               | 1956-57.                                        | 1957-58. | 1958-59. | 1959-60 (not yet finalized). |
|                                               | LAKHS.                        | LAKHS.                                          | LAKHS.   | LAKHS.   | LAKHS.                       |
| I. Food Grains—                               |                               |                                                 |          |          |                              |
| (i) Major Irrigation ..                       | 0.90                          | 0.16                                            | 0.34     | 0.18     | 0.11                         |
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| (v) Improved seeds ..                         | 3.90 (—)                      | 0.17                                            | 0.56 (—) | 0.09     | 0.13                         |
| (vi) Japanese method ..                       | ..                            | 0.33                                            | 0.19     | 0.54     | 0.23                         |
| (vii) Plant protection ..                     | 0.30                          | 0.09                                            | 0.15     | 0.30     |                              |
| Total ..                                      | 12.79                         | 2.05                                            | 2.09     | 1.82     | 2.15                         |
| II.                                           |                               |                                                 |          |          |                              |
| (i) Oil seeds ..                              | 1.68                          | 0.15                                            | 0.26     | 0.67     | 1.20                         |
| (ii) Sugarcane ..                             | 10.00                         | 1.77                                            | 2.37     | 2.17     | 2.00                         |
| (iii) Cotton (Bales) ..                       | 1.55                          | 0.32                                            | 0.61     | 0.65     | 0.10                         |

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- (5) Scheme for purchase and distribution of dusters and sprayers at concession rate.
- (6) Urban compost scheme.
- (7) Scheme for development of local manurial resources.
- (8) Scheme for the development of Night Soil Compost in bigger panchayats.
- (9) Pilot scheme for development of Night Soil Compost in smaller villages.
- (10) Japanese method of paddy cultivation.
- (11) Pilot scheme for destruction of rats.
- (12) Horticultural Development.
- (13) Increasing the production of Oilseeds.
- (14) Cashew Development Scheme.
- (15) Sugarcane Development Scheme.
- (16) Road Development Scheme in the Sugar Factory areas.
- (17) Increasing the production of cotton.
- (18) Scheme for the establishment of a regional coconut Research Station in Thanjavur district.
- (19) Coconut nursery scheme.

(20) Scheme for the establishment of Four Demonstration Coconut Plantations in the Kazhuvelli swamp area in Tindivanam, South Arcot district.

(21) Scheme for the establishment of Parasite Breeding Stations for the biological control of *Nephantis serinopa*.

(22) Scheme for increasing coconut-oil production.

(23) Scheme for development of coconut cultivation in Ramana-thapuram.

(24) Comprehensive scheme for establishment of more regional orchards-cum-nurseries.

(25) Establishment of small-scale Fruit Reservation units.

(26) Scheme for training of Gardeners.

(27) Scheme for Improvement of Meenambalayam Tobacco.

(28) Tobacco Development in Kanyakumari district.

(29) Scheme for strengthening of the Agricultural College, Coimbatore.

(30) Upgrading the Agricultural College and Research Institute, Coimbatore.

(31) Scheme for Developing Agricultural College and Research Institute, Coimbatore, into a Regional Post-graduate Research Institute.

(32) Agricultural Information service.

(33) Scheme for investigation of Betelvine wilt.

(34) Scheme for the simple fertilizer trials in cultivators fields.

(35) Sugarcane Research and Gur Manufacture scheme.

(36) Scheme for the intensification of Research on citrus, mangoes and grapes at the Fruit Research Station, Periakulam.

(37) Banana Research Scheme, Aduthurai.

(38) Model Agronomic Experiments, Bhavanisagar.

(39) Model Agronomic Experiments, Aduthurai.

(40) Establishment of the Extension Section at the Agricultural College and Research Institute, Coimbatore.

(41) Artesian wells.

(42) Tube-wells.

(43) Filter-Point Tube-well Scheme.

(44) River-Pumping Scheme.

(45) Oil engine hiring scheme.

(46) Hire-purchase scheme for oil engines and electric motors.

(47) Tractor Hiring scheme.

(48) Tractor hire-purchase scheme.

(49) Soil Conservation.

The progress made under each scheme is furnished in Appendix 6.

## VI. AGRICULTURAL EXTENSION WORK IN THE COMMUNITY DEVELOPMENT AND NATIONAL EXTENSION SERVICE AREAS.

The administrative control of the Blocks is vested with the Block Development Officers and the technical control with the District Agricultural Officers. The programme of Agricultural Development work (with targets under each scheme) drawn up for each block as implemented by the Gramasevaks under the guidance of the Extension Officer for Agriculture. In addition to the number of Gramasevaks provided for each block, each Agricultural Extension Officer is provided with a fieldman and two Demonstration Maistries for attending to the more technical aspects of the work. Each block is provided with an Agricultural Depot which supplies agricultural requisites such as seeds, fertilisers, implements and pesticides. The depot is run by the Extension Officer for Agriculture with the assistance of a Lower Division Clerk.

2. A minimum programme has been fixed for each block in the Community Development and National Extension Service area in G.O. Ms. No. 550, Public (Rural Development Programme), dated 23rd February 1959. The salient features of the programme are as follows:—

(1) Providing each block with a power-sprayer and necessary implements.

(2) Equipping each Gramasevak with certain number of hand sprayers, dusters and other implements.

(3) Laying out of at least three demonstration plots by each Gramasevak per year in each village.

(4) Setting up of a Demonstration Farm in each Gramasevak's jurisdiction.

(5) Subsidised sale of green manure seeds, vegetable seeds, fruit seedlings, pesticides, implements, etc.

Fixed amounts have been allotted for each of the above items.

3. The particulars of achievements under the various schemes in the areas covered by the Community Development and National Extension Service schemes are furnished in Appendix 8.

4. There are 226 blocks including Community Development, Stage I, Stage II and pre-extension as on 1st April 1960 against 197 as on 1st April 1

## VII. SPECIAL FEATURES OF THE YEAR.

## (a) IMPLEMENTATION OF INTENSIVE AGRICULTURAL DISTRICT PROGRAMME IN THE YEAR 1959-60.

The report on the implementation of Intensive Agricultural District Programme in the year 1959-60 is furnished below :—

In 1959, a team of experts on food production made a special tour of the country at the instance of the Government of India to assess the local resources and facilities for increasing agricultural production.

2. The team recommended after the tour an integrated intensive programme based on the existing resources and facilities of the country and the community.

The team reported that India is likely to face the ' Stark threat of a 28 million ton foodgrain shortage by the end of its Third Five-Year Plan in 1966 unless there is an immediate and drastic increase in production. The Third Five-Year Plan envisages an output of 110 million tons of foodgrains by 1965-66. In 1958-59 the output was 73 million tons, the largest on record. To reach the 110 million tons by 1965-66, production has to increase at the rate of 5 to 6 per cent annually against 3½ per cent increase for the past five years.

3. Based on these recommendations the Intensive Agricultural District Programme popularly known as ' Package Programme ' has been drawn up.

Rapid increases in food production are possible if certain factors such as improved seed, fertilisers, plant protection measures and easy farm credit are all provided especially in areas where the soils are good, irrigation water is assured, natural hazards are minimum and co-operatives and other village institutions could be strengthened rapidly. The full production potential can be realised only when all the essential elements are combined into one integrated, impact programme. The Intensive Agricultural District Programme is a step in this direction. It is a programme for concentrating efforts in an intensified manner in promising areas so as to secure immediate gains in farm production.

The programme will also demonstrate the most effective ways of increasing production by the application of scientific ' know-how ' and set a pattern for extending such a programme to other similar areas having assured water-supply and where conditions are favourable for intensifying effort.

The programme will simultaneously provide :

(1) Adequate and timely supplies of production requisites such as seed, fertilisers, implements, pesticides, etc., through the co-operatives.

(2) Adequate and timely supply of credit to enable the farmers to purchase the full supplies available. This will be based on the production plans formulated for the participating farmers and will be made available through strengthened Cooperative Societies and with the co-operation of the Reserve Bank of India.

(3) Marketing arrangements and other services through co-operatives so that farmers can get a fuller value for all their surplus produce, enabling them to repay the production loans taken through the co-operatives.

(4) Intensive education of farmers in latest farming techniques through such media as scientific demonstrations.

(5) The strengthening of transport arrangement to ensure the mobility of staff and supplies.

(6) Increasing the number of godowns so as to provide supplies and marketing facilities within bullock-cart distance.

The programme includes the establishment of Agricultural Workshops for the manufacture and repairs of improved agricultural implements used by farmers. There will be local works programme directly related to increased production.

The efforts at the district level among the staff of the different departments will be co-ordinated by the District Collector who will be in overall charge of the programme. He will be assisted by a Project Officer, Joint Director of Agriculture, Package Programme.

At the State level, such co-ordination will be achieved through a Co-ordination Committee.

A comprehensive survey will be undertaken initially to study the present status of agricultural developments in the district. The progress from season to season would be measured through a series of crop cutting experiments.

To begin with, the programme is to cover 5.8 million acres in about 10,000 villages with more than five million people in seven districts in seven States at the rate of one district per state.

The States and districts selected are—

- (1) West Godavari—(Andhra Pradesh).
- (2) Shahabad—(Bihar).
- (3) Ludhiana—(Punjab).
- (4) Aligarh—(Uttar Pradesh).
- (5) Pali—(Rajasthan).
- (6) Raipur—(Madhya Pradesh).
- (7) Thanjavur—(Madras).

The Ford Foundation has agreed to provide 10.5 million dollars or Rs. 5 crores for the seven districts to increase food production by at least 50 per cent in five years.

4. The Ford Foundation has sponsored the programme making a generous financial grant to meet a good portion of the cost of the programme, the balance of expenditure to be met both by the State and Central Governments.

5. In Madras State, this programme was inaugurated in Thanjavur district at a special function on 13th April 1960, i.e., the Tamil New Year's Day, by the Minister for Agriculture and it was presided over by the Chief Minister, Madras.

6. A meeting of a high-power committee consisting of the Commissioner for Food Production, Secretary for Food and Agriculture Department, Secretary, Board of Revenue, Director of Agriculture and the Collector of Thanjavur presided over by the Minister for Agriculture was held on 23rd April 1960, when the ways and means for implementing the programme were decided. A second meeting was held on 24th April 1960 at which both the officers who attended the meeting on 23rd April 1960 and important non-officials in Thanjavur district discussed the various aspects of the scheme and considered suggestions for implementing it, with effect from June 1960.

7. A sub-committee was appointed on 25th April 1960 consisting of the Collector of Thanjavur, Deputy Secretary for Food and Agriculture Department, Madras, and the Joint Director of Agriculture (Extension) for drawing up a plan of action for implementing the programme. Accordingly a programme of action was drawn up by this sub-committee and approved by Government.

8. The Joint Director of Agriculture, Intensive Agricultural District Programme, Thanjavur, joined duty on 15th June 1960 and organised his office in the Palace Buildings. He held series of meetings along with the Collector of Thanjavur at Sirkali, Pattukkottai, Tiruvarur, Kumbakonam, etc., with the District Agricultural Officers, Block Development Officers and Agricultural Extension Officers. Instructions were given on the selection of villages, preparation of farm plans and methods of implementing the scheme.

9. In the selection of area, it was decided that the scheme should be implemented in whole villages forming 20 per cent of the cultivated area of each Development Block to form a compact area, instead of selecting 20 per cent of the cultivated area of each of the villages in the block as originally contemplated. The programme contemplates a close study of the holding of each farmer and his resources in order to draw up a production plan for increasing production as well as the income from the holding. The extension staff who are to operate in the area were given a course of training in the principles of farm management and the preparation of farm production plans.

10. The preparation of farm production plans was scheduled to be completed before 15th July 1960. Fifty thousand farm production Plan forms were got printed and supplied to Block Development Officers.

11. Maps of each block showing the compact area selected for implementing the programme have been prepared. The maps also show details such as roads and railway, cooperative stores for distributing fertilisers, agricultural depots and jurisdiction of Agricultural Extension Officers.

12. The requirements of fertilisers were worked out for each of the villages in the selected area of each block and the quantities of fertilisers to be stocked every month were also furnished to the Collector, who is in charge of the allotment of fertilisers in the district.

13. The quantities of seeds and pesticides required to meet the full need of farmers were worked out and arrangements were made to store them in the different Agricultural Depots.

A list of co-operative societies has been drawn up for stocking and distributing fertilisers so that farmers in the selected villages can obtain their requirements from a convenient distance (not having to go more than five miles for the purpose).

14. Arrangements have been made for carrying out a Resources (bench mark) Survey at the beginning of the Programme and also the assessment survey required for gauging the progress made under the programme.

15. A total of seven meetings were addressed by the Joint Director of Agriculture in different centres and villages explaining the essential features of the scheme to officials of the Revenue, Co-operation and Community Development Departments, Village Officers such as Panchayat Presidents, Village Munsifs, Karnams and Farmers.

#### (b) THE WORLD AGRICULTURAL FAIR AT NEW DELHI.

Active participation by the State Agricultural Department in the World Agricultural Fair held at New Delhi in 1959-60 was one of the outstanding features of the year. In the midst of National and International participants, the impressive and magnificent show put up by the Department attracted the attention of one and all.

The Madras State Pavilion was a replica of the famous Rameswaram temple. The sanctum sanctorum was the Central Agricultural stall, around which other Departments of the Madras Government displayed their exhibits. This arrangement had been made in conformity with the Central theme of the entire exhibition, viz., the important role played by the Agricultural Department.



ment for the benefit of mankind. The tank in front was modelled after the temple tanks of the South. At entrance to the corridor was a Nathaswaram Party playing the famous Carnatic music. The panels on the corridor depicts the agricultural progress in the State and the village life and Community work. The devolution of power to the people and the part the future Panchayats are to play in stepping up production were also shown.

The State Agricultural Department was responsible for the design and the general lay-out and the murals and dioramas on the corridor. The allied Departments, Forestry, Industries, Animal Husbandry, Information and Publicity, Irrigation, Fisheries and Co-operation, also brought out a rich collection of exhibits. All the exhibits were made in Madras. The pavilion was thus in its entirety a State Show.

The Agricultural Sector commenced with a model of the famous Tiruvarur Temple Car in paddy and Spices about 8 feet in height and 6 feet in diameter. This was a very interesting piece of art and dexterity in workmanship which no visitor to the World Fair missed.

The following sections of the Agricultural College and Research Institute, Coimbatore, displayed their exhibits in the Agricultural Sector :—

1. *Paddy*.—The various varieties improved varieties popularised in Madras State were displayed such as GEB. 24, Co. 19, Co. 25, TKM. 1, TKM 5, ADT. 3, ADT. 20, ADT. 8, ASD. 5, Co. 13: The most popular preparation of the rice were (1) popped, (2) Puffed and (3) Beaten rice. The Madras map with strains suitable for the different districts has also been displayed. (Actual samples were displayed in tubes.) Collection of paddy varieties (a rich world rice varieties display in tubes) was also displayed.

2. *Millets*.—Various varieties of millets and pulses grown in Madras State such a Cholam, Cumbu, Ragi, Tenai, Varagu, Samai, Panivaragu, Kudiraivali were displayed. The area and yield of the millets in various districts of the Madras State were depicted. The uses to which millets are put to, the various food products and the methods of preparation were presented in four posters.

3. *Cotton*.—A map of Madras State showing location of the Karunganni Zone and the important districts of cultivation and also Cambodia Zone and the important districts of cultivation were displayed. Acreage under cotton and coverage by improved varieties in three dimensional histogram plastic models was put up. Acreage and production of cotton for the plan period in the State in three dimensional histogram plastic models was also presented.

4. *Oilseeds*.—Various varieties of Oilseeds and exhibits were displayed such as production plan for Oilseeds, Oilseeds earn foreign exchange, Oilseeds Development in Madras, improved

strains of groundnut, sesame and castor in Madras, the various agronomic practices by the adoption of which the cultivators succeed in achieving high yields in groundnut, trace elements for higher groundnut yields, coconut—the Kalpagavriksham, Oilseeds for nutrition and selected coconut seedlings.

5. *Horticulture*.—Various Horticultural products and practices were displayed. Various kinds of fruits grown in Madras State such as Queen of fruits, Anab-E-Shahi Grape, Off-season Mangoes, Co. 1. Papaya, Eucalyptus, Clove, Nutmeg, Cacao, Vanilla and essential oils were displayed. Cardamom and Cashew were also exhibited.

6. *Agronomy*.—Model exhibits were put up showing the students of B.Sc. (Ag.) course of the college taking part in all farm operations. So also models showing the lady students transplanting paddy in wet lands were also depicted. Exhibit showing a short course for young farmers for six months being conducted in the College were also depicted. Exhibits showing the Madras State being foremost in Green Manure Campaign were also displayed.

7. *Agricultural Extension*.—The following three exhibits were displayed :—

- (1) Recipe for bigger and better crops (three posters).
- (2) Progress of Agricultural Education.
- (3) Madras leads in crop yields.

Exhibits on Botany, Agricultural Meteorology, Plant Pathology, Chemistry, Entomology, Soil Science (Chemistry) were put on the show.

8. *Engineering*.—The following work models were also displayed :—

- (1) Groundnut Decorticator.
- (2) Filter-Point Tube-well.
- (3) *Soil Conservation work in Madras State*.—In addition

to the above, five cut-out models revealing the evolutionary improvement of tools and implements in all agricultural operations were also depicted.

Adjoining the smaller corridor there was a lovely Samiana giving a festive appearance to the whole pavilion which housed the ' Madras Restaurant ' where delicious South Indian Dishes were served to the visitors. Edibles such as Squashes, Jams, Pickles, Gingelly Balls, Coconut Balls, Cashewnut-roasted, Puffed rice were also distributed to important visitors. The Madras State Pavilion got a shield as a first prize.

A party of progressive farmers of the State was taken to the Fair by the State Farmers' Forum with the financial assistance of the State Government. These farmers had the exclusive benefit of seeing and learning some of the latest developments in the field of agriculture in the World.

## VIII. RESEARCH.

Research work is carried on mainly at the Agricultural Research Institute, Coimbatore and the Crop Breeding Stations attached to it, as well as in the several Agricultural Research Stations and Regional Research Centres, located in the State. The review of research work done during the year is presented under the following heads :—

- (1) Research Council.
- (2) Agricultural Chemistry.
- (3) Agricultural Entomology.
- (4) Agricultural Mycology.
- (5) Agricultural Meteorology.
- (6) Botany.
- (7) Plant Physiology.
- (8) Cytogenetics.
- (9) Agronomy.
- (10) Agricultural Engineering.
- (11) Crop Improvement Research.
- (12) Agricultural Research Stations.
- (13) Botanic Gardens and Parks.

The Scheme for the centralisation of the offices of the Agricultural College and Research Institute, Coimbatore, which was originally sanctioned in G.O. Ms. No. 356, Agriculture, dated 8th February 1955, continued to function during the entire period under report.

The Principal, Agricultural College and Research Institute, Coimbatore, continued to be the Head of office till 31st May 1960 and with effect from 1st June 1960 the Dean is declared as the Head of the Institution having the administrative control over the Central Office of the Agricultural College and Research Institute, Coimbatore, dealing with all matters, pertaining to establishment, accounts, audit reports, etc., which were previously dealt with by twelve different Section Heads. As per the new set up the post of Associate Dean (previously designated as Principal) is sanctioned with a view to assist the Dean in routine work connected with Under-graduate and Post-graduate Courses. The post of Administrative Officer and the post of Accounts Officer were continued during the period under report. Consequent to the creation of the post of Dean from 1st August 1958 the designation of the Joint Director of Agriculture (Research) was changed as Additional Director of Agriculture, Coimbatore, and the Dean was designated as Dean and Additional Director of Agriculture.

## 1. RESEARCH COUNCIL.

The Principal and Vice-Principal continued to be President and Secretary respectively of Research Council. After the retrenchment of the post of Vice-Principal from 1st June 1959 Sri M. Bhavanishanker Rao, Oilseeds Specialist was acting as Secretary, Research Council, till 10th February 1960. After the demise of Sri M. Bhavanisankar Rao, Sri T. Natarajan is acting as Secretary, Research Council being the seniormost Crop Specialist. During the period under report 31 meetings were held for the scrutiny of the Research Programmes, Progress Reports and miscellaneous items pertaining to Research.

## 2. AGRICULTURAL CHEMISTRY.

## A. SOIL SCIENCE.

1. *Effect of different cations on the physico-chemical properties of the major soil types of Madras State.*

Two laterite soil samples one from Pattambi (surface soil) and another from Nanjanad (sub-soil) were taken and calcium, magnesium, potassium and sodium soils of the two samples were prepared by leaching the soils with N/2 solutions of calcium chloride, magnesium chloride, potassium chloride, and sodium chloride and the physico-chemical properties of these soils were studied in comparison with those properties of the respective original soils. Mechanical analysis of the original soils were done.

Calcium soils of the laterite soils of both Nanjanad and Pattambi have shown considerable increase in water holding capacity and dispersion co-efficient and a slight increase in moisture equivalent when compared to the original soils. There is not much difference between the original and calcium soils in real and apparent specific gravities. The pH values in both cases are lower in calcium soils than those of original soils. Volume expansion has increased in calcium soil of Nanjanad and decreased in calcium soil of Pattambi when compared to those of the original soils and in case of pore space the reverse is the case. In case of magnesium soils both Nanjanad and Pattambi soils exhibit lower dispersion co-efficient than those of the respective original soils. Moisture equivalent in both cases have slightly increased when compared to those of the respective original soils. Real and apparent specific gravity, pore space and pH are decreased in case of Nanjanad magnesium soil whereas these properties show an increase in case of Pattambi magnesium soil when compared to those properties of the respective original soils. Water holding capacity and volume expansion show considerable increase in case of Nanjanad magnesium soil whereas these properties show decrease in case of Pattambi magnesium soil when compared to those properties of respective original soils. The differences of the same properties between Nanjanad and Pattambi soils may be due to the fine and coarse texture of the respective soils. In general the magnesium soils in both cases form very friable crumbs, a property considered

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Calcium soils of the laterite soils of both Nanjanad and Pattambi have shown considerable increase in water holding capacity and dispersion co-efficient and a slight increase in moisture equivalent when compared to the original soils. There is not much difference between the original and calcium soils in real and apparent specific gravities. The pH values in both cases are lower in calcium soils than those of original soils. Volume expansion has increased in calcium soil of Nanjanad and decreased in calcium soil of Pattambi when compared to those of the original soils and in case of pore space the reverse is the case. In case of magnesium soils both Nanjanad and Pattambi soils exhibit lower dispersion co-efficient than those of the respective original soils. Moisture equivalent in both cases have slightly increased when compared to those of the respective original soils. Real and apparent specific gravity, pore space and pH are decreased in case of Nanjanad magnesium soil whereas these properties show an increase in case of Pattambi magnesium soil when compared to those properties of the respective original soils. Water holding capacity and volume expansion show considerable increase in case of Nanjanad magnesium soil whereas these properties show decrease in case of Pattambi magnesium soil when compared to those properties of respective original soils. The differences of the same properties between Nanjanad and Pattambi soils may be due to the fine and coarse texture of the respective soils. In general the magnesium soils in both cases form very friable crumbs, a property considered

to be favourable for crop production. Potassium soils of both Nanjanad and Pattambi laterite soils exhibit an increase in properties like apparent specific gravity and moisture equivalent than the respective original soils. There is a marked decrease in properties like moisture holding capacity and pH in case of potassium soils of both Nanjanad and Pattambi. Potassium soils of Nanjanad exhibit increase of volume expansion and dispersion co-efficient and decrease of real specific gravity and pore space whereas potassium soils of Pattambi exhibit decrease of volume expansion and dispersion co-efficient and increase of real specific gravity and pore-space. Analysis of sodium soil indicates that Nanjanad and Pattambi soils exhibit greater water holding capacity, pH, dispersion co-efficient and moisture equivalent than the respective original soils. Sodium soil exhibits lower real specific gravity and pore-space whereas the gravity and volume expansion. In case of Nanjanad soil sodium soil exhibits lower real specific gravity and pore-space whereas the reverse is the case in Pattambi soil. Sodium ion seems to improve the pH of the laterite soil to a certain extent which is a desirable feature, but it is found to reduce the expansion and shrinkage of the laterite soil and forms somewhat hard crumbs which properties are undesirable in laterite soils.

Two alluvial soil samples one from Aduthurai (surface soil) and another from Kulithalai (sub-soil) were taken and hydrogen, calcium, magnesium, potassium and sodium soils were prepared by leaching these alluvial soils with N/2 solutions of hydrochloric acid, calcium chloride, magnesium chloride, potassium chloride and sodium chloride respectively and their physico-chemical properties studied in comparison with those properties of the respective original soils. Mechanical analysis of the original soils were also done.

Hydrogen soils of both Aduthurai and Kulithalai soils exhibit considerably lower apparent specific gravity volume expansion, pH, moisture equivalent and dispersion co-efficient, when compared to the respective original soils. The pore-space has increased in both cases. Potassium soils of both Aduthurai and Kulithalai soils have higher real specific gravity and pore-space, than the respective original soils. The volume expansion and moisture equivalent have considerably lower volume expansion pH, moisture equivalent compared to the original soils. There is no marked difference in apparent specific gravity and pH between potassium soil and original soil. Calcium soils of both Aduthurai and Kulithalai have considerably lower volume expansion, pH, moisture equivalent and have remarkably lower dispersion co-efficient than the respective original soils. There is not much difference in real and apparent specific gravity between calcium and original soils in both cases. Magnesium soils of both Aduthurai and Kulithalai soils have considerably lower apparent specific gravity and dispersion co-efficient and pH. There is no other remarkable feature in magnesium soils. Sodium soils of both Aduthurai and Kulithalai

soil have higher real specific gravity, water holding capacity, pore-space and volume expansion and remarkably higher moisture equivalent than the respective original soils and very high dispersion co-efficient. Sodium ion seems to be good in increasing the water holding capacity, pore-space, volume expansion and moisture equivalent which is desirable where conservation of moisture is a problem. But in alluvial soils in which case drainage is a main problem sodium ion is most undesirable because it increases the dispersion co-efficient to a great extent and it reduces the drainage very much. It is also undesirable because it increases the alkaline nature of the soil and it also increases the sticky nature of the soil.

## 2. Effect of indigenous soil conditioners on the different soil types of Madras State.

To study the effect of structural alteration in the soils of Madras State: Studies on crop growth with these indigenous soil conditioners were taken up to ascertain the value of these conditioners on crop response.

*Pot culture experiments.*—During the year under report the experiment on block soils was continued and completed. Experiments with laterite soils was also completed. Studies on alkali soils have just commenced and the work is in progress.

On black soils, pot culture experiment was continued with indigenous soil conditioners, namely, paddy husk, saw dust and tamarind seed powder. Synthetic soil conditioners Aerotil and Krilium were included in the experiment for a comparative study. 3,000 gms. of soils were taken in each pot and there were three levels of dosages of the conditioners, namely,  $2\frac{1}{2}$ , 5 and 10 per cent by weight of the soil. The synthetic conditioners were applied at 0.1 per cent level. Moisture was maintained at 30 per cent level. The pots were watered at five days interval for this purpose. Soil samples were drawn periodically for three months and the effect of these conditioners on the physical properties were studied by aggregate analysis, estimation of water holding capacity, soil reaction, etc. During the period under report the final set of soil samples were drawn and the analysis were carried out. The results indicated a reduction in pH following the application of these conditioners. This is characteristic in tamarind seed powder treatment. Aggregate size about 7 mm. are higher in tamarind seed powder treatment. Influence of these conditioners on crop growth was studied with ragi. Treated soils indicated good response in tamarind seed powder treatment.

In continuation of this experiment a similar one with laterite soils of Nanjanad was taken up for the study. Research work was continued on similar lines. The results indicate similar influence as that observed in other types of soils, but to a lesser degree. Now studies on alkali soils have been taken up in a similar fashion with

soil conditioners. The first set of soil samples were analysed during the period under report. The results of analysis indicate the reduction in soil reaction from 8.6 to 7.8. It is marked in tamarind seed powder treatment. The water holding capacity was found to increase from 58.22 to 79.28 in the treated pots.

Aggregate analysis and percolation studies are in progress.

To study the influence of these conditioners on crop growth, ragi seedlings were obtained from the Central Farm and transplanted in pots at the rate of four plants per pot. The study has been taken on two sets of soils, one receiving a basal dressing of cattle manure at 25 gm./pot and the other with no manure. The crop has been well established in all the treatments in both the sets of experiment. Crop growth measurement will be taken up from July onwards. The growth seems to be vigorous in the tamarind seed powder treatments.

A scientific article under the title 'The influence of paddy husk, saw dust and tamarind seed powder on some physical properties of the soil and on crop growth' has been prepared and submitted for the Tenth Scientific Workers Conference to be held in August 1960.

### 3. Anion exchange studies.

To study the influence of various anions like hydroxyl, silicate and chloride on the release of fixed phosphates in the laterite soils of Nilgiris, a pot culture experiment with ten treatments comprising different levels of lime, sodium chloride and sodium silicate was started. The soil moisture was kept at 50 per cent field capacity and periodical analysis of soil samples were done. From the analysis of soils inferences were drawn that (1) the pH increases with passage of time in all treatments, (2) the available phosphate increased in all treatments including control where it has almost doubled, (3) the exchangeable phosphate value has a marked fall and is inversely related to available phosphate, (4) the total anion exchange capacity value fluctuates in some cases, the reason for which is not quite clear. To study the factors which make phosphate available to plants through anion exchange the pot experiment with the following treatments was continued to study the effect of organic manures on the exchangeable phosphate and anion exchange capacity in the laterite soils of Nilgiris:—

- (1) Soil alone.
- (2) Soil +  $P_2O_5$  at 60 lb. per acre as super.
- (3) Treat 2 + Farmyard manure at 10,000 lb. per acre.
- (4) Treat 2 + Farmyard manure at 20,000 lb. per acre.
- (5) Treat 2 + Green leaves at 5,000 lb. per acre.
- (6) Treat 2 + Green leaves at 10,000 lb. per acre.

The soil moisture was kept at 50 per cent field capacity and soils were drawn at definite intervals for analysis.

Though there is a slight increase in pH the change is not remarkable. There is abrupt increase and fall in the value for exchangeable phosphate. To certain degree there is abrupt increase in available phosphate also. The values for the total anion exchange capacity widely fluctuate.

The experiment was continued with black soil on similar lines. It is proposed to study the crop response in the above treatments in this experiment. The experiment is in progress.

### 4. Correlation of results of rapid soil testing methods with those of the traditional methods of soil analysis.

Soil samples analysed at the Soil Testing Laboratory by the rapid soil tests were analysed for total nitrogen, available potash and phosphoric acid, water soluble salts, etc., by the traditional methods of soil analysis. More samples have however to be analysed to work out a correlation between the results of the different methods.

### 5. Indian Council of Agricultural Research Scheme for the Reclamation of Saline and Alkaline lands.

Soil samples were drawn up to two feet in the experimental plots and profile samples were drawn to the depth of 4 feet-6 feet depending upon the location. The studies included soil pH, water soluble salts mechanical composition, degree of alkalisation and plant nutrient status as determined by NKP. The samples were drawn prior to the application of amendments and every year after the harvest of crops. Infiltration ratio, C/N ratio and microbial activity will also be studied in as many samples as practicable.

During the period under report field experiments were conducted at Nemmani, Paramakudi. They were also started in Veerapanjan, Madurai district. Only the layout of the plot could be done at Kallamozhi, Tiruchendur.

*Laboratory studies.*—After the harvest of paddy ASD. 5 on 16th February 1959, 36 soil samples were drawn from the experimental plots at Nemmani, Paramakudi from the layers 0-1 foot and 1-2 feet. A profile pit was dug at Kallamozhi, Tiruchendur and six samples of soil were drawn from the layer 0-1 foot to 5 feet to 6 feet. Four profile pits were dug at Veerapanjan, Madurai and 16 samples of soil were drawn up to the fourth foot. Forty-eight samples of soils were drawn from the experimental plots at Kallamozhi from 0-1 foot and 1-2 feet layers. The following determinations were made:—

- (1) pH.
- (2) Water soluble salts.

(3) Mechanical composition.

(4) Base exchange.

(5) N, P and K.

(6) C : N ratio.

Dispersion co-efficient and permeability were also studied in a few samples.

The pH values indicate that the plots are getting to be more uniform than either at the start of the experiments, or even during the previous year. The pH of the Kallamozhi profile samples range from 9.2 to 9.6. The reclamation of these soils is likely to be hard, but it can be hoped that with persistence, success can be achieved. The pH values of Veerapanjan test plots indicate that these plots are much more alkaline than the Kallamozhi test plots and hence likely to present a more formidable problem than either the Nemmani or the Kallamozhi plots. The results for the water soluble salts of Nemmani soils indicate that a considerable amount of improvement has resulted ever since starting of these experiments, all the treatments have been found to be effective. Even the mere impounding of water in the soil and resorting to percolation drainage instead of surface drainage has been very effective.

The base exchange capacity of Paramakudi soil is higher than those of Veerapanjan but if the base exchange is expressed in relation to the clay content of the two soils, the Veerapanjan soils have a higher base exchange capacity than the Paramakudi soils. The results when compared to last year's figures indicate that though the total base exchange capacity in the first foot soil at Nemmani tend to fall, due to the increase in the monovalent bases there is a rise in the degree of alkalisation over those of the preceding years.

The Kallamozhi samples indicate a lower total base exchange capacity but the degree of alkalisation is as high as in the Veerapanjan. The data for Veerapanjan indicates that in those plots there is also sodium hazard.

The range of nitrogen present in the Nemmani soils is between 0.025-0.112. The highest nitrogen is seen in the plot with 5,000 lb. green manure and 4 tons of gypsum per acre followed by the plot with 2,500 lb. green manure. The highest value for  $P_2O_5$  is recorded in the plot with 5,000 lb. green leaf per acre. The range of K in these soils is 0.159 to 1.166, the lowest value being in the control plot and the highest in the plot with Farm Yard Manure at 5 tons per acre. The C : N ratio of the soils range from 2.25 to 11.36 indicating a lot of soil heterogeneity.

The Percolation Studies indicate that the good effects of gypsum not only vanish but even a depressing effect is seen after the lapse of two years. the data also reveal that the bunding.

draining and normal cultivation appear to be sufficient for having a better drainage than could be obtained by resorting to the application of gypsum.

After the harvest of daincha in July 1959 the daincha crop was trampled and paddy ASD 5 was transplanted. The crop was harvested in March 1960. The plots had been treated with soil amendments only in 1957. The yield data has been analysed statistically and when all the 15 treatments are considered together there is no significance.

The gypsum treated plots gave poor yields, which indicates that gypsum applied in 1957 has lost its good effects by two years and after that such plots depressed in their yields. These need further study.

The analysis reveals that all treatments including digging of drainage channels and bunding the field, etc., have been effective in reclaiming the soil.

It is noteworthy that a plot where not even a blade of grass could be grown previously has been brought to a condition where it can produce an average acre yield of 1,332 lb.

#### 6. Estimation of Inorganic Ions by Paper Chromatography.

The object of the study was to investigate the reliability of chromatography method in detecting the determining common ions met with in agricultural analysis. A new method for the analysis of aluminium in soil was established qualitatively. As 5 per cent potassium hydroxide extract of soil to serve for investigation of soil degradation was taken and analysed chromatographically using methanol-acetic acid (1 : 3) as solvent mixture and alcoholic alizarin sulphonate as spraying reagent. But this method was not satisfactory. The same alkaline extract was taken to estimate calcium in soil but was not satisfactory. Only qualitative analysis was satisfactory but quantitative estimation was not satisfactory.

#### 7. Soil Testing Service.

1. *Charge.*—The post of Assistant Soil Chemist remained vacant from 23rd May 1959 till 5th April 1960. Shri S. Venkatachalam, B.Sc., Assoc. I.A.R.I., took charge of the post on 6th April 1960 forenoon.

2. *Staff.*—Sri S. Mustaq Ahmed, K. T. Ramakrishnan and T. S. Subramanian continued as Junior Scientific Assistants up to February 1960. All of them resigned their posts and were relieved on 18th February, 17th February and 21st April 1960 respectively. Kumari S. Saradambal joined as Junior Scientific Assistant on 14th April 1960 and the other two posts of Junior Scientific Assistants remained vacant.

*Tours.*—The Junior Scientific Assistants visited two development blocks and collected 22 soil samples in July 1959.

The Assistant Soil Chemist in charge along with his assistants attended the Soil Testing Workers' Conference at Madras in July 1959.

#### B. COLLECTION OF SAMPLES, ANALYSIS AND RECOMMENDATION.

A total of 3,650 samples of soils and 269 of waters were registered in the laboratory during the year. The details of collection of soils are as follows :—

|                            |     |     |     |     |       |
|----------------------------|-----|-----|-----|-----|-------|
| Soil testing service       | ... | ... | ... | ... | 22    |
| National Extension Service | ... | ... | ... | ... | 1,677 |
| Agricultural Department    | ... | ... | ... | ... | 1,306 |
| Others                     | ... | ... | ... | ... | 636   |
| Total                      |     |     |     |     | 3,641 |

The samples were air dried, passed through 2 mm. sieve and were analysed by the rapid chemical methods for salinity, alkalinity and available nutrients. All the samples of soils received could not be tested due to unsatisfactory staff position and only 2,533 samples were tested and 2,522 fertilizer recommendations were made during the year.

#### C. FOLLOW UP WORK.

The follow up work is intended to assess how far the fertilizer recommendations were beneficial to the cultivators and will give an indication of whether the recommendations need any modification or refinement. Although the Extension Officers who collected the samples and the cultivators were requested to send the yield figures before and after following soil testing recommendations, no data was forthcoming and hence this part of the work has to be attended to by the staff of the Soil Testing Service. Here again many cultivators do not keep the records of yields properly and special efforts are needed to collect follow up data. During the year under report no follow up data was collected.

#### D. SOIL TEST SUMMARIES.

Soil test summaries of the soils analysed were prepared every month classifying what percentage of soils tested come under low, medium and high with respect to nutrient status, etc. The soils of the State are generally deficient in nitrogen and phosphorus while potash is mainly well supplied.

#### E. EXTENSION PUBLICITY.

Suitable charts and posters were put up in various exhibitions to attract the attention of the visiting farmers to the free service rendered by the Soil Testing Service. Visitors to the laboratory from the blocks, etc., were taken round and shown the testing methods and method of collecting samples explained.

#### F. MISCELLANEOUS.

The Soil Testing Service has been taken over by the State Government from 1st September 1959 and is continued as a temporary scheme.

#### 8. Soil Survey of the Amaravathy Project Area.

A base map of the ayacut area (1 inch = 1 mile) showing important roads, villages, etc., was prepared. An appraisal of the quality of irrigation water in the ayacut area was made by completely analysing one hundred and odd water samples in the laboratory. The analytical data obtained were compared with the categorisation schemes put forward by the Research Workers in the U.S. Salinity Laboratory. Canal and river waters in the ayacut area are of low sodium and low salinity. The well waters however are of medium to high salinity but the sodium hazard for these waters is of low order.

Two profile pits were dug in each sub-water shed according to topography and the soil samples were collected for detailed laboratory examination after noting the profile description.

Field studies indicated that the elevated areas are occupied by moderately drained shallow latosols and the valleys by alkali soils of varying gradation with impeded drainage. Nodular calcium carbonate occurs in the surface and sub-soils of Dharapuram taluk, while it occurs in deep layers that too occasionally in Udumalpet taluk.

The Laboratory Studies indicated that the entire area is sandy to sandy loam in texture. The elevated areas are moderately saline while low-lying areas are leached alkali soils with low permeability judged from the standard set up by research workers elsewhere, the entire ayacut area has been tentatively classified as third rate from the point of irrigation suitability. A general improvement of the drainage system and its maintenance in good repair are recommended as essential for good response to irrigation in the area.

#### 9. Soil survey of the Perambikulam-Upper Aliyar Project area.

The Scheme for the Soil Survey of the Perambikulam-Upper Aliyar Project Area was sanctioned in G.O. Ms. No. 1799, dated 27th April 1959, communicated in the Director of Agriculture's Endorsement Y.2. 988, dated 6th May 1959. The Scheme started functioning from 6th March 1960 with the Assistant Agricultural Chemist taking charge of the post. One Soil Survey Assistant joined duty on 1st May 1960. The preliminary work connected with the reconnaissance soil survey, such as the preparation of the base map of the project ayacut, preparation of a plan of the traverse of the area and the location of profile pits, etc., have been done.



10. *Indian Council of Agricultural Research Scheme for Studies on the Reversion of Phosphates in the Laterite Soils in Nilgiris.*

The Scheme was first sanctioned by the Madras Government in G.O. Ms. No. 2109, Food and Agriculture, dated 12th July 1957 and was implemented on 18th July 1957. The three-year period of sanction covered by this Government Order expired on 31st March 1960. The Indian Council of Agricultural Research has subsequently sanctioned the continuance of the scheme for two years from 1st April 1960 and the State Government have accorded sanction in G.O. Ms. No. 1624, Food and Agriculture, dated 4th May 1960 for the continuance of the scheme for two years from the date of expiry of the original sanction (from 1st April 1960 to 31st March 1962).

*Object of the scheme.*—The object of the scheme is to study the availability of phosphate by the addition of organic matter and lime in the lateritic soils of Nilgiris with a view to not only release the locked up phosphorus but also render it available for a prolonged period to crop growth.

*Work done during the year.*—(i) *Field experiments.*—Experiments were continued for the second year in succession on the 1959 main season potato crop at the Agricultural Research Station, Nanjanad. The trials were conducted in the plots laid out for the previous years' experiments accommodating the following seventeen treatments randomised and replicated thrice.

For phosphates (rock phosphate, superphosphate, bone meal and dicalcium phosphate) × two levels of lime (0 and 7,500 lb. per acre) × two levels of green leaf (0 and 5,000 lb. per acre) with the local Nanjanad mixture as control.

The phosphates were incorporated in the Nanjanad mixture in the place of bonemeal and superphosphate which are the sources of phosphates in that mixture. The N and K sources were the same as in Nanjanad mixture. All the plots received 80 lb. N, 200 lb.  $P_2O_5$  and 100 lb.  $K_2O$  per acre in the form of the different fertilizer mixtures prepared for the individual treatments.

The main potato crop of the 1959 season which was planted on 8th April 1959 was harvested on 25th August 1959. The statistical analysis of the yield data has revealed the following:—

(i) The differences among phosphates and 'lime' and 'no lime' alone are significant.

(ii) Dicalcium phosphate is superior to rock phosphate and bone-meal; super-phosphate is superior to bone-meal but on a par with dicalcium phosphate and rock phosphate. Rock phosphate and bone-meal are on a par.

(iii) The application of lime is clearly beneficial.

After the harvest of the potato crop, a crop of barley was raised for studying the residual effects of the treatments. The

crop, which was sown on 23rd September 1959 and harvested on 4th February 1960 has failed probably due to the conditions as obtained at the Agricultural Research Station, Nanjanad, not being favourable to this crop.

The Indian Council of Agricultural Research has sanctioned the continuance of the Scheme up to 31st March 1962 and has approved the technical programme for the extended period which has been drawn up taking into consideration the remarks offered by the Soil Science Committee, while considering the extension proposals.

Experimental plots were accordingly laid out in Field No. 33 of the Agricultural Research Station, Nanjanad, for the conduct of trials on the summer potato of the 1960 and 1961 seasons accommodating the following twenty-four treatments randomised and replicated thrice.

Six levels of phosphates (Nophosphate, rock phosphate, super phosphate, bone meal, silico phosphate and Nanjanad mixture) × two levels of lime (0 and 7,500 lb. per acre) × two levels of farm compost (0 and 6,000 lb. per acre). The quantity of compost is based on nitrogen equivalent to that in 5,000 lb. per acre of green leaves used for the previous years' experiments.

The plots were laid out on 25th February 1960. Calculated quantities of lime were applied to those plots coming under lime treatment on 26th February 1960. On 24th March 1960, about a fortnight prior to taking up potato planting, the plots under compost treatment were applied with the required quantities of farm compost.

The use of silico phosphate as the phosphate carrier for the potato crop has been included in the trials. Nearly 100 pounds of this fertilizer were prepared by fusing in the oil fired furnace at the Tractor Workshop, Coimbatore a mixture of Trichy phosphate, serpentine and sodium sulphate in the ratio of 10 : 3 : 3. The fertilizer analysed 17.26 per cent total  $P_2O_5$  and 15.12 per cent citric acid soluble  $P_2O_5$ , thus having 87.58 per cent of the total phosphorus in the citric soluble form.

Calculated quantities of the different fertilizers were mixed for the different treatments incorporating the phosphate carriers in the Nanjanad mixture in the place of the usual sources of that ingredient in the said mixture and having the same sources of N and K. All the plots will receive in the shape of fertilizer mixtures prepared for the individual treatments 80 lb. N, 200 lb.  $P_2O_5$  and 100 lb.  $K_2O$  per acre. The mixtures were applied to the plots on 9th April 1960 and potato was planted the same day.

Germination counts, height measurements and other observations are being recorded periodically.



The crop will be ready for harvest by about the middle of August 1960.

(ii) *Pot experiments*.—The pot experiments initiated side by side with the field trials last year and with the same treatments as in the field were continued. The differently treated soil in one set of pots was maintained at a constant moisture level without any crop and nine rounds of samples at monthly intervals were drawn for analysis for pH and available  $P_2O_5$ . The other two sets were planted with the crops experimented upon, viz., potato and barley. Leaf samples were drawn from these crops once during their growth and whole plant samples were collected at harvest.

Side by side with the field experiments on the main season potato crop this year, pot culture trials were also started at the Agricultural Research Station, Nanjanad. Two sets of pots were set up, each set consisting of twenty-four pots to represent the different treatments included in the field experiments. Calculated quantities of lime, compost and fertilizers were incorporated into the soil in the pots coming under the respective treatments on the same day when the plots received treatments. Two tubers of the same variety and size used in the field were planted in each pot on 9th April 1960. Leaf samples from these pots were drawn on 16th June 1960.

(iii) *Collection of samples and analysis*.—Post harvest surface and sub-soil samples drawn from the experimental plots after the harvest of the potato crop in August 1959 were analysed for the major nutrients. The analysis of these samples for all the ingredients stipulated in the technical programme are not yet over. Composite samples of soil both from the surface and sub-surface have been collected from the field coming under the experiments this year. A sample of soil used for the pot experiments has also been collected. These samples have been prepared for analysis and the same will be taken up in due course.

Samples of potato and barley leaf collected from the pots last year have been analysed for N and  $P_2O_5$ . From the analysis of potato leaf samples, it is seen that, when phosphates are used alone without amendments, the samples from the control plots, viz., Nanjanad mixture treatment was found to analyse the maximum contents of both N and  $P_2O_5$ . In respect of the four types of phosphates used as the only source of  $P_2O_5$ , application of lime has considerably increased the N content of the leaf. In the case of total  $P_2O_5$  the samples from the pots treated with super-phosphate and dicalcium phosphate in combination with lime and green leaf analysed a slightly higher content of this ingredient. The whole plant samples collected at harvest are under analysis.

Out of the nine rounds of soils sample collected at monthly intervals from the single set of pots where the soil was treated differently as in the case of field experiments and maintained at a constant moisture level without any crop, the first six rounds

were analysed for pH and available  $P_2O_5$ . The remaining samples are under analysis. It is seen from the available data that, application of lime either alone or in combination with green leaf has definitely raised the pH of the soil by nearly 1.5 units and the rise in pH is maintained for a considerable length of time. Regarding available  $P_2O_5$ , the general trend is that the availability of  $P_2O_5$  is increased by the addition of lime in the case of the different phosphatic fertilizers used except dicalcium phosphate in which case application of green leaf seems to have a beneficial effect.

## B. MANURES AND PLANT NUTRITION.

### 1. *Permanent Manurial Experiments*.

(a) *Old Permanent Manurial Experiments*.—These plots were laid out in 1909 and till the end of last year 90 crops were grown under rainfed conditions to study the effect of continuous cropping on soil manured with 'cattle manure' and artificials supplying Nitrogen Phosphorus and Potash singly and in combination, continuously year after year in the same plots. There are altogether ten treatments but without any replication. During the year under report cholam (CO. 1) was sown in July 1959. There was a heavy incidence of striga weed and they were promptly removed. The crop was harvested in December 1959. The highest yield in grain and straw were obtained from the 'cattle manure' plots followed by 'NKP' and 'NP' treatments.

After the harvest of cholam, the field was kept fallow to be sown with tenai in August 1960.

The surface soil samples were analysed, for nitrogen, moisture, total phosphoric acid and total potash. The analysis of soil for mechanical analysis and water soluble salts is in progress.

The analysis of cholam grain and straw is also in progress.

(b) *New-Permanent Manurial Experiment*.—This experiment is being conducted since 1925, on the same lines as in O.P.M. experiment except that the crops are raised under irrigated conditions with one replication. So far 57 crops have been raised. During the year under report cumbu (CO. 3) was sown in November 1959. The crop was harvested in March 1960. The yield data show that the highest yield of grain and straw in both the eastern and western series were obtained from the 'Cattle Manure' plots followed by 'NPK' and 'P' plots. After the harvest of cumbu the field was kept fallow to be sown with cotton.

The analysis of soil samples for moisture, nitrogen, iron, alumina, lime and total phosphoric acid were carried out. The analysis of soil for mechanical analysis, and water soluble salts is in progress.

The analysis of cumbu grain and straw is also in progress.

## 2. Influence of manuring on the quality of grains Nutritive value of cereals.

Twenty ragi grain samples and twenty tenai grain samples for the year 1958-59 from the differently manured plots of the New and Old permanent Manurial Experiments respectively were analysed for amino-acids in protein hydrolysate.

Ten Ragi grain samples for the year 1959-60 from the differently manured plots of the new permanent manurial experiments were analysed for total and phytin phosphorus colorimetrically and Potassium, Nitrogen and calcium by routine methods. Amino Acids in protein hydrolysate were also estimated for the above samples by circular paper chromatography.

In both ragi and tenai grains, Valine, leucine—Isc-lencine, tryptophane-tyrsine and lysine were the prominent Amino acids present in all the differently manured plots. In both the cases lysine and tyrosine were found to decrease with increase in total protein content.

From the total and non-phytin phosphorus content of ragi grain from the NPM plots of Eastern series (for the year 1959-60) it will be seen that the addition of phosphorus to the soil, as fertilizer, in general, has increased both forms of the phosphorus. The cereal grains from NP and NPK treatments were found to contain higher phosphorus and non-phytin phosphorus than the grain from cattle-manure treatments. Inorganic fertilizers have not only increased the total phosphoric acid but also increased the potash, lime and protein content of the grain. The cattle-manure treatment has given the highest yield but the potash content is low.

## 3. Foliar application of Major Nutrients to plants—Alternate sources of nitrogen for foliar spray without scorching (Observation trail).

To study the efficacy of foliar spray of peptonised cake on potato crop fresh observational plots of 2 cents each have been laid out in Field No. 3/13 to accommodate the following four treatments:—

- (1) Complete Nanjanad mixture plus water spray (full NPK).
- (2) 60 N plus full PK as Nanjanad mixture plus 20 N as peptonised G.N. cake spray.
- (3) 40 N plus full PK as Nanjanad mixture plus 20 N as peptonised G.N. cake spray.
- (4) 20 N plus full PK as Nanjanad mixture plus 20 N as peptonised G.N. cake spray.

The potato crop for the year 1959-60 was planted on 9th April 1959. Owing to unfavourable weather condition, the first spraying of peptonised cake could be taken up, only on June,

8th, 1959 i.e., 60 days after planting, subsequently two more sprayings were given on the 15th and 22nd June 1959 respectively. The fourth and final spraying scheduled for the 29th June 1959 could not be given due to heavy rains on that day. The growth of the plant in the above study was satisfactory in all treatments and the crop was harvested on 26th August 1959. It is seen that the performance of the crop under the different treatments is in the following descending order: Treatments: 2, 3, 4 and 1.

## 4. Chelates in the Nutrition of paddy (Observational trial).

A pot culture experiment was conducted with paddy (variety CO 25) to study the effect of an iron chelate as compared to pure 'EDTA' and green leaf, on the growth and yield of paddy. The chelates were applied at three different levels, viz., 0.5 gm, 0.75 gm, and 1.0 gm, per pot. The following nine treatments were tried, replicated 4 times:—

- (1) NPK (N=30 lb. N, P=30 lb.  $P_2O_5$  and K=30 lb.  $K_2O$  per acre).
- (2) NPK plus green leaf
- (3) NPK plus Iron chelate 0.5 gm.
- (4) NPK plus Iron chelate 0.75 gm.
- (5) NPK plus Iron chelate 1.0 gm.
- (6) NPK plus green leaf plus iron chelate 0.5 gm.
- (7) NPK plus EDTA 0.5 gm.
- (8) NPK plus EDTA 0.75 gm.
- (9) NPK plus EDTA 1.0 gm.

The green leaf was applied at 5,000 lb. per acre.

Periodical growth measurements were recorded. The crop was harvested and the yield of grain and straw separately recorded. The analysis of grain and straw samples is in progress.

The data indicate an increase yield of grain with the application of the chelate which is the maximum at the lowest level of the iron chelate. In comparison, green manure treatment has given better yield than the chelate treatments, and iron chelate has given a better yield than the pure EDTA. The iron chelate when applied in combination with the green leaf has however given the highest yield of both grain and straw.

## OTHER ITEMS OF RESEARCH.

1. Scheme for research on the storage of cakes of groundnut  
(Indian Central Oil-seeds Committee scheme).

*Chemical analysis.*—The raw materials were analysed for moisture, ether extractives, acid values, protein nitrogen and soluble nitrogen. The changes occurring in oil were followed by the

changes in free fatty acid values. The changes occurring in proteins during storage were followed in the periodical estimation of total nitrogen, protein nitrogen, and soluble nitrogen. Samples were drawn at the commencement of the work and thereafter at monthly intervals.

**Entomology and Mycology work.**—The stored products were examined for insect population to assess the kernel damage. The kernel damage was assessed by determining, portions of whole, half and broken nuts. Kernels less than half were taken as broken nuts. For insect count, only larval, pupal and adult stages of respective insects were counted.

**Summary.**—The difference between the maximum and minimum values (i.e.), the range was calculated for all heads of analysis in all treatments and varieties and arranged in a three way table. This data was subsequently subjected to statistical analysis. The different main effect and interactions were listed, namely, heads of analysis X treatments X variety which was assumed as 'Nil'. The difference among the levels of heads of analysis, varieties and their interactions alone proved significant. It would follow, therefore, that for judging the behaviour of a given variety, particular head of analysis has to be considered. An examination of the table heads of analysis, viz., variety revealed that the total oil content or total nitrogen content or non-protein nitrogen content may be used as a criterion for judging the behaviour of any variety during storage because the varieties indicate fairly uniform range values for these attributes.

The range value for moisture in Peanut variety is much greater than the other two varieties. This high range value is due to the much higher initial moisture which this variety had at the commencement of the experiment and is not a characteristic head of analysis for judging its behaviour.

In spite of this higher initial moisture the variety has not developed much acidity. The variety Coramandel on the other hand, with a comparatively low moisture at the start, a favourable aspect from the point of view of rancidity development and insect infestation has developed a much higher free fatty acid content while with the same moisture at start, the rednatal variety has not develop any such high acid values.

It appears that the containers galvanised iron drums and mud pots are not in any way superior to gunny bags, in many respects.

While gunnies lined with polythene appear to be superior to clean gunnies, in some respects in certain varieties, the findings are not statistically significant.

As regards, cakes, the expeller cakes have better storage behaviour. It is quite clear that water, gum or jaggery cannot be used as binding material for groundnut cake if the cake is to be stored

for a fairly long time. The containers, drum and mud pot do not appear in any way superior to gunnies and gunnies lined with polythene.

Among the packing materials tried it appears gunnies and gunnies lined with polythene are the best for groundnut kernels and cakes. Further trials to confirm and to find a better mode of storage are in progress.

## 2. Apparatus for simulating Rainfall.

The apparatus was set up to simulate rainfall over a small area of soil. Making use of this apparatus, the black soil was subjected to simulated rainfall. Samples drawn at intervals of two months were analysed for iron and alumina, calcium and organic matter.

The analyses have shown that there is no characteristic variation in alumina, iron, calcium or organic matter content of the soil, subjected to periodical leaching and drying. It is preferable to study this aspect of laterisation over a considerably long period of interval, to obtain anything of significant interest, since, in nature this process extends over geological years. Hence this work is discontinued.

## Economic gain to ryots.

The extent to which ryots are benefited, the increase in acreage of crop concerned, the increase in the quantity of produce and its estimated money value cannot be given at present, as they will be known only after the successful completion of all the investigations and the results passed on to the cultivators.

## 3. AGRICULTURAL ENTOMOLOGY.

**Research.**—Research work was carried out on the items envisaged in the Three-year programme for 1957-59 ending with December 1959 and in the new programme for 1960-62 commencing from 1st January 1960. Intensive work on the bionomics and control of paddy stem borer, sugarcane borers, research on bee-keeping studies on the toxicology and adverse effects of synthetic pesticides and insect pests of vegetables were carried out under the auspices of the special schemes. The details of the work done and the results so far achieved are given separately under different heads.

1. (a) *Firing up of a schedule of treatments against pests of paddy.*—This experiment was conducted during the summer and monsoon seasons in 'Split plot' design with two main plot treatments, viz., three rounds and four rounds of application of insecticides and nine sub-plot treatments, viz., different insecticides with four replications. Co. 19 paddy was the variety for the main season crop and Culture 6522 was taken up for summer season crop. The different insecticides tried for the main season

crop were (1) BHC 10 per cent dust; (2) DDT 5 per cent dust; (3) Toxaphene 10 per cent dust; (4) BHC spray-0.1 per cent; (5) DDT spray 0.2 per cent; (6) Parathion (Folidol) Spray 0.025 per cent; (7) Endrin spray 0.02 per cent; (8) Toxaphene 0.1 per cent spray and (9) appropriate control. In the case of the summer season crop, the variants used were the same as in the case of the main season except the product 1250 spray was substituted in the place of toxaphene 0.1 per cent spray. Data gathered in respect of percentage of reduction indicated the superiority of Folidol spray—0.025 per cent closely followed by sprays of Endrin and Toxaphene both in three and four rounds of treatments. The grain yield data were statistically analysed and were found to be significant in the case of sub-plot treatments, viz., the number of times of applications. Endrin spray is the most outstanding of all the insecticides in recording the highest yield. The other insecticides except D.D.T. dust were, however, superior to control.

The data gathered regarding the summer season trial, i.e., percentage of infestation and yield per acre were statistically analysed. The findings were that in respect of reduction in pest population, Endrin spray 0.02 per cent has given encouraging results in general, closely followed by Parathion (Folidol) spray—0.025 per cent. As far as grain yield is concerned, Endrin spray 0.02 per cent has given the maximum acre yield.

(b) *The rice bug (Leptocorisa acuta Th.)*—Control measures evolved against this bug have already indicated the efficacy of BHC 10 per cent dust. Experiments to try the efficacy of some of the latest insecticides, viz., Endrin, Dieldrin and Toxaphene dusts have been designed and the trials will be taken up at the time of incidence of the pest.

2. *Pests of Cholam*—*The cholam stem-borer-Chilo zonellus* S.—The trials on the stem borer were conducted during July 1959 to January 1960 on Co. 1 cholam and Co. 18 during February to June 1960 in field Nos. 4 and 1 respectively in the new area of the Central Farm. The experiment was designed on a randomised and replicated pattern having four replications. The insecticides tried were sprays of Parathion (Folidol) 0.025 per cent, Dieldrin 0.1 per cent and dusts of BHC, DDT and Chlordane at 5 per cent strength. In the second experiment, all the above mentioned insecticides were included with the exception of 5 per cent dusts of DDT and Chlordane. Two rounds of treatments were applied during the crop growth, the first round commencing at the time of incidence of the pest and the next after an interval of three weeks. The data gathered with reference to the incidence of the pest and yield were statistically analysed.

From the statistical analysis, the reduction in the percentage of pest incidence was found to be significant with the minimum pest incidence in Parathion (Folidol) spray 0.025 per cent and the yield also was significant.

The second experiment was conducted during February—June in field No. 1 in the new area on the same line with the same variants except 5 per cent dust of DDT and Chlordane.

Statistical analysis of the data gathered revealed that the percentage of reduction in pest incidence was highly significant with the minimum pest infestation in Endrin 0.02 per cent spray which was more or less on a par with the sprays of Parathion (Folidol) 0.025 per cent, Aldrin 0.1 per cent, Dieldrin 0.1 per cent, BHC 5 per cent dust and Basudin 0.1 per cent spray. The incidence of the pest in the control plots was found to be significantly higher than the other treatments. The yield was not statistically significant.

3. *Pests of Oilseeds*—(a) *The castor semilooper, Achoea janata* L.—The experiment could not be taken up during the period, as the incidence of the pest was very mild to take up control trials with insecticides. The occurrence of the larval parasite *Microplites ophiusae* R which was in appreciable numbers might have been the possible factor for the low incidence of the pest.

(b) *The castor shoot and pod borer—Dichocrocis punctiferalis* G.—Insecticidal trials were conducted on variety TMV 1 castor in field No. 39 in randomised block replicated four times with the insecticides, viz., sprays of Parathion (Folidol) 0.05 per cent, Endrin 0.02 per cent, Malathion 0.1 per cent, DDT 0.1 per cent, BHC 0.05 per cent and 10 per cent dusts of DDT and BHC with control. Three rounds of treatments were given at monthly intervals, the first round commencing at the flowering stage of the crop. The data in relation to percentage of infestation and yield were not statistically significant though Malathion spray and BHC dust gave some indicative results in the control of the pest.

(c) *The castor aleurodid—Trialeurodes ricini* M.—Bionomics of the castor aleurodid is under study in pot culture conditions. An entomogenous fungus, *Spicaria* sp. has been isolated which seems to attack the pest. No insecticidal trials were conducted during the period.

(d) *The red hairy caterpillar—Amsacta albistriga* M on groundnut.—Groundnut crop at the Government Zonal Nucleus Seed Farm, Pollachi, was kept under regular observation during the period under report and as there was no marked incidence of the pest, no trials were undertaken during the season. However, during May 1960 insecticidal trials were conducted in a ryot's field at Achipatti, Pollachi taluk, the chemicals used, viz., Folidol 2 per cent dust, Aldrin 1.5 per cent dust, Dieldrin 1.5 per cent dust, BHC 10 per cent dust, Endrin 1 per cent dust, Parathion (Folidol) 0.025 per cent spray, Gusathion spray (1 oz. in 3 gallons) and control. No conclusive results could be arrived at due to adverse seasonal conditions.

4. *Pests of fruits*—(a) *Fruit sucking moth (Othereis sp.)*.—An initial survey of orange gardens in Chatrapatti area (Palni taluk) was made for laying out control trials against the citrus fruit sucking moth. The trials will be conducted during the ensuing season (August—December) to find out a suitable method of control either by the application of insecticides or by baits.

(b) *Insecticidal trial against Helopeltis antonii. S on Guava.*—A few trees were selected for the conduct of this experiment in the College Orchard and before the commencement of the insecticidal trials, the infested fruits were removed. The trials were conducted with four treatments—viz., sprays of Endrin 0.02 per cent, Malathion 0.1 per cent, DDT 0.02 per cent and control and each treatment replicated three times. The first round of treatment was commenced on 25th June 1960 and the trials are in progress.

5. *Pests of cotton*—(a) *The cotton stem weevil—Pemphcrulus affinis F.*—Experiments were taken up at the Central Farm on MUC. 1 variety in field No. 75 with the following variants under randomised and replicated conditions.

|                                       | PER CENT. |
|---------------------------------------|-----------|
| (1) Parathion (Folidol) spray .. .. . | 0.05      |
| (2) Dieldrin spray .. .. .            | 0.1       |
| (3) Aldrin spray .. .. .              | 0.1       |
| (4) Endrin spray .. .. .              | 0.02      |
| (5) Toxaphene dust .. .. .            | 10        |
| (6) Agrocide cotton dust .. .. .      |           |
| (7) Control .. .. .                   |           |

Three rounds of treatments were given at monthly intervals, synchronising with the time of initial infestation. The pest incidence was very negligible throughout the season in all the treatments and the yield data gathered did not give any conclusive results.

(b) *The cotton leaf roller—Sylepta derogata F.*—Insecticidal trials were not taken up during the year as the incidence of the pest was very negligible.

(c) *Observational trial against cotton jassids (Empoasca devastans—D.)*.—An observational trial was conducted in field No. 4 A. at the Millets Breeding Station on the variety 3030G. The insecticides used were sprays of Product 1250, 0.05 per cent, Parathion (Folidol) 0.025 per cent, and Endrin 0.02 per cent. Two rounds of treatments were given, one on 30th December 1959 and the other on 17th January 1960. Plots treated with Product 1250

spray at 0.05 per cent concentration recorded the least incidence of jassid. There was no marked difference in yield among the insecticides and the yield data were not statistically significant.

(d) *Fixing up a schedule of treatment against the pests of cotton.*—A randomised replicated trial was conducted on MCU. 1 in field No. 75 in the Eastern Block of the Central Farm during September 1959. The following insecticides were tried, viz., sprays of Parathion (Folidol) 0.025 per cent, Endrin 0.02 per cent, and Product 1250, 0.5 per cent besides control. The number of applications given was three and four rounds in separate sets of plots, commencing from the fourth week stage of the crop and repeated there after at monthly intervals in respect of three rounds of spray and at triweekly intervals in the case of four rounds. The maximum percentage of reduction was recorded in the plots treated with Parathion (Folidol) 0.025 per cent spray while sprays of Endrin at 0.02 per cent and product 1250 at 0.05 per cent coming next in the order of reduction in pest population.

6. *Pests of tuber crops*—(a) *The sweet potato weevil—Cylas formicarius F.*—Previous experiments have indicated that three rounds of Dieldrin 0.1 per cent spray at fortnightly intervals and dusts of Dieldrin and Aldrin applied twice at intervals of a fortnight during tuber formation reduced the incidence of the pest.

A replicated experiment will be conducted during the ensuing monsoon season for which nursery has been raised. The pattern of the experiment will be a 'Split plot' one. The main treatments will be (i) dipping the vines before planting, (ii) foliar sprays at the time of tuber formation and (iii) soil applications of dust formulations. The sub-treatments will be (i) Endrin, (ii) Dieldrin, (iii) BHC and (iv) Aldrin (dusts and sprays). Varietal studies, will also be undertaken.

(b) *The Tapioca scale: Aonidomytilus albus Ck.*—An observational trial to evaluate the efficacy of the following insecticides against the above pest has been laid out in the Western Block of the Central Farm, viz., Sprays of Parathion 0.025 per cent, Malathion 0.01 per cent, Gusathion 0.1 per cent and Basudin 0.1 per cent. Four available varieties have also been planted for observations on varietal incidence. The types grown in the College Orchard were observed for the incidence of this scale and variety "Butter stick" was found to be highly susceptible.

7. *Pests of Stored Products—Insecticidal trial against Bruchus theobromæ L.*—A randomised replicated field trial against this pest which infests the pods of redgram and continues as a pest in storage was conducted with the following variants, viz., dusts of DDT, BHC and Chlordane 5 per cent, Aldrin 2 per cent, Dieldrin 1.5 per cent and Toxaphene 10 per cent with separate set of control

plots. Three rounds of treatments at triweekly intervals commencing from the flowering stage were given and the results assessed with reference to percentage of infestation and yield. This experiment under field condition was designed to eliminate the initial source of infestation. Toxaphene 10 per cent dust recorded the minimum percentage of infestation and maximum yield.

8. *Soil insecticides*.—An experiment was laid out in October 1959 at Mandapam block area, Ramanathapuram district, to study the effects of soil application of insecticides against chafer grubs infesting Cumbu. The treatments comprised of 10 per cent dusts of BHC and Toxaphene, 3 per cent dust of Heptachlor and 1.5 per cent of Dieldrin. The insecticides were mixed with sand and applied to the soil at intervals of thirty days, the actual quantity being 2 lb. of actual ingredient per acre. The observations were confined on the total number of clumps per plot, number infested and the number of grubs in each plot. BHC 10 per cent dust recorded the lowest incidence, viz., 8.9 per cent. The percentage of infestation was progressively higher in the other treatments, Dieldrin recording the highest percentage of incidence, viz., 28.7.

9. *Biological control*—(a) *The Australian lady bird beetle: Cryptolaemus montrouzieri* Muls.—The liberation of the above predatory beetle was not undertaken during the period under report in view of the fact that the incidence of the mealy bugs on brinjal and cotton was very meagre. Nevertheless, a nucleus stock of the said predator was being maintained for the pursuit of further studies.

(b) *Parasites and Predators*.—A nucleus stock of *Neplantis parasites, Perisierola nephantidis* N and *Trichospilus papirora* F was maintained throughout the period. The parasites were released in infested gardens as and when necessary. Intensive collections of various caterpillars were made to rear the larval parasites if any.

(c) *Studies on the life history feeding habits*.—Studies on the life history feeding habits of the following Coccinellids, viz., *Chilomenes Sexmaculata* F, *Coclophora* sp, *Brumus sutaria's* F and *Coccinella repanda* T were in progress. The mycophagous coccinellid, *Thea cincta* F was found feeding on powdery mildew on gingelly plants treated with systemic insecticides.

The Coccinellid beetle, *Chilocorus nigrinus* F was found feeding on scales *Aonidiella* spon coconut and also on *Saissetia nigra* N on roses. Life history studies of the predatory beetles, viz., (i) *Clanis pubescens* N, (ii) *Seymnus nubilus* M— are in progress with a view to exploit their potentialities for controlling insect pests.

10. *Investigations on the insecticidal properties of some indigenous poisonous plants*.—Aqueous extracts of the following parts of plants mentioned below, were prepared and sprayed on aphids, and caterpillars with and without the addition of soap:—

Agave americans—Mucilagenous matter  
Tinospora cordifolium—Stem  
Anona squamosa leaves (fresn and dried)  
Coleus aromatica leaves  
Datura metal leaves.  
Thevetia neriifolia bark  
Neem oil emulsion, and Calotropis gigantea leaves.

None of them were found effective against aphids and caterpillars. Acetone extract of the endosperm of *Cucurbita pepo* seeds and *Anona squamosa* seeds gave some indicative results against aphids. However, the trials have to be repeated once again to arrive at a confirmatory result.

Dikkamali, a resinous product, oozing out of the roots and stems of *Gordenia gummifera* a shrub belonging to the family Rubiaceae was powdered and dried against the granary pests. It was not found effective. The effect of the powdered exocarp of *Sapindas marginatus* fruit against granary pests is under study.

11. *Adverse effects of insecticides*.—Experiments were carried out to study the adverse effects of the various insecticides, viz., sprays of DDT, BHC, Lindane, Toxaphene, Dieldrin, Aldrin, Basudin and HETP at 0.1 per cent concentration, 0.05 per cent concentrations of sprays of Parathion and Endrin and 5 per cent dusts of BHC, DDT and Chlordane and 1.5 per cent dust of Dieldrin on greengram, bhendai and tomato. The experiment was conducted under pot culture conditions with two replications. Three rounds of treatments were given to the plants the first commencing a month after sowing, followed by two more treatments at fortnightly intervals thereafter. Endrin spray 0.05 per cent encourages secondary infestation of mites in all the three crops mentioned above. Endrin followed by Parathion, promoted good plant growth in bhendai while Parathion spray 0.05 per cent showed a spectacular crops growth in tomato also. BHC spray 0.1 per cent as well as 5 per cent dust product slight off flavour in the case of greengram. Experiments were carried out on the above lines of study the effect of following insecticides, viz., 0.1 per cent sprays of BHC, DDT, Aldrin, Dieldrin, Basudin and HETP and 0.05 per cent sprays of Endrin, and Parathion on Sunhemp, Daincha, Sesbania and Pillipesara plants under potted conditions. The treatments were replicated four times. Good crop growth was noted in all the green manure plants which received an application of 0.05 per cent sprays of Parathion and Endrin. Endrin

was found to encourage secondary infestation of mites in all the four crops. DDT spray 0.01 per cent also brought about secondary infestation of mites in the case of sunhemp.

12. *Fundamental studies*.—Studies on the seasonal incidence and life history of the pests of Jasmine, greenmanure crops, roses, cruciferous crops, tamarind and hairy caterpillars were in progress. The bionomics of the Coccinellid beetles, viz.—*Clanis puoeseens* M and *Seymnus nubilis* M were also taken up.

13. *Economic aspect of earthworms*.—Studies on the fertility of the soil due to the presence of earthworms were started during the month of March 1960. Earthworms at the rate of ten were introduced in pots which had soil samples drawn from wet lands, Eastern block of the Central Farm Millet Breeding Station and Insectary. The soils from the different areas used in these experiments were previously analysed to find out the fertility level of the soils. Two months after the introduction of earth worms, soil samples were drawn from these pots and were sent to the Agricultural Chemist for soil analysis to indicate the fertility level. The results of analysis showed no marked difference in the N.P.K. level of soils. Subsequently another set of samples drawn after an interval of two months have been sent to the Agricultural Chemist for analysis and the results of the same are awaited.

14. *Mite pests of crops*.—This is new item under the Three-year programme of Research for 1960-62. Observational trials were conducted against the castor red mite *Tetranychus telarius* L. with the following acaricides. (i) Folidol spray 0.025 per cent. (ii) Aramite spray—1 oz. in 1 gallon of water; (iii) Ultra sulphur spray oz. 3-1/8 gallons of water and (iv) Sulphur dust; and (v) control. Sulphur dust proved to be superior in the matter of controlling redmites when compared with the rest of the acaricides. Parathion spray 0.025 per cent was found to be next in the order of efficacy.

15. *Bee-keeping*.—An average strength of 40 bee colonies was maintained for experimental purposes at the Apiary during the year. The Apiary was a source of attraction for a number of individuals farmers, students and other interested persons. Work on breeding pedigree queens for improving the honey yielding capacity of the Indian bee-*Aphis indica* F, trials on pollen substitutes, swarm control and other fundamental aspects was in progress under the auspices of a special scheme sanctioned by the Indian Council of Agricultural Research. Consequent to the termination of the scheme on 31st March 1960 items like selective breeding of queen bees, studies on swarm control methods and on the different types of nives were continued as part of the three-year programme of work.

A total quantity of 116 lb. 2 oz. of honey was extracted during the course of the year and the maximum obtained from a single colony was 9 lb. 1 oz. The month of March was favourable for bees and a maximum quantity of 48 lb. 13 oz. of honey was extracted. Fifty-two pounds of crude bees wax were obtained from the Forest Department as well as from private dealers for manufacturing and supplying foundation sheets. The demand for comb foundation sheets was on the increase and the total quantity sold for the year was 41 lb. 5 oz.

Under selective breeding, both line breeding and cross breeding were adopted. *Tecoma capensis* was noted for the first time as a source of nectar in August and tow grasses *Cymbapogon* (Karava, and *Cymbapogon flexuosus* (Cochin leuca grass) were noted as pollen sources in February.

*Training and Propaganda*.—Efforts were made to diffuse bee-keeping knowledge to the public by putting up bee exhibits, conducting special lectures and giving necessary help and advice to interested persons as and when opportunities occurred.

16. *Systematics*.—Consequent on the closure of the Scheme for augmenting the named insect collections at the Agricultural College and Research Institute, Coimbatore, on 31st March 1959, work on the rearrangement and reclassification of the insect collections was continued as one of the items in the Three-year programme of Research. Accordingly under this item of Research a total of 80 insects belonging to the family Noctuidae were rearranged during the period.

*Review of work done under scheme*.—Schemes financed by the Indian Council of Agricultural Research and other Commodity Committees—(i) *Paddy Stem Borer Scheme, Aduthurai*.—(Financed by the Indian Council of Agricultural Research).—The Scheme for research on the Stem borer pest of paddy was extended for a period of three years from 1st April 1958 to 31st March 1961. The work was carried out as per the technical programme. Studies on the varietal susceptibility to the attack of stem borer, the influence of the time of sowing on the incidence of the pest, and control methods, viz., by raising a trap crop of paddy before the main season, mechanical removal of egg masses and by breeding fishes in the paddy fields were in progress. The incidence of the pest was found to be the least in plots treated with Parathion 0.025 per cent spray. Endrin 0.03 per cent also recorded a low incidence next to Parathion. Both the treatments gave high yields.

(ii) *Scheme for the establishment of a Regional Bee Research Station at Coimbatore* (financed by the Indian Council of Agricultural Research).—The scheme was having its third extension



period and terminated on 31st March 1960. Breeding pedigree queens influence of weather on nectar secretion and its concentration, study and careful description of the various faces of bees occurring in the different regions with reference to the taxonomy and biometry, pollen substitutes and swarm prevention methods were the items taken up as per the technical programme.

(iii) *Scheme for Research on the Toxicology and adverse effects of synthetic insecticides* (financed by Indian Council of Agricultural Research)—Studies on the toxicology and adverse effects of systemic pesticides, viz., Systox, Metasystox and Pestix 3 H were in progress. Their efficacy in controlling the cholan stem borer, cotton bollworms and coccids were under testing. Observations on the phytotoxicity of these insecticides on plants raised under pot culture conditions were continued.

II. *Vegetable Scheme*—Indian Council of Agricultural Research Scheme.—The post of Entomology Assistant was upgraded to that of an Assistant Entomologist with effect from 1st April 1960 and since the investigations are in charge of an Assistant Entomologist. The work has been in progress as per the technical programme. Studies on the insecticidal control of the tomato fruit borer *Heliothis armigera* H. and *Prodenia litura* F. Bhendai shoot and fruit borer—*Earias fabia* S. and *Earias insulana* B. Brinjal fruit borer—*Leneinodes orbonalis* G. and fruit flies on bitter melon—*Dacus* sp. were taken up. Besides the above pests investigations on the following pests, viz., Brinjal Epilachna, *Phthorimoca ilap-sigona* H. and bhendaj jassid *Empoasca devastans* D. were in progress.

III. *The Sugarcane Insect Pests Scheme, Coimbatore* (financed by the Indian Central Sugarcane Committee).—Research work was carried out as per the approved technical programme for the year. The fundamental studies were undertaken mainly with a view to observe the effects of climate and weather as also of micro climatic conditions inside the crop on the pest population in Sugarcane, so as to enable the forecasting of pest incidence. A high day temperature of 88.1 F coupled with moderate field humidity of 82.3 per cent were favourable for the multiplication of *Chilo-traea infuscatella* S. Moderate day temperature of 82.9 F with a high humidity of 86.3 per cent were conducive for the increase of *Proceras indicus*, K. Insecticidal control trials against the termites did not give any conclusive results as the incidence of the pest was very meagre. Endring 1 per cent was found to cause a reduction in the incidence of *Chilo-traea infuscatella* S. Gammaxane EC with Lissopal was found to cause a reduction in the incidence of *Chilo-traea infuscatella* S. Gammaxane EC with Lissopal was found to reduce the incidence of the top shoot borer—*Scirpophaga nivella* F.

As per the recommendations of the Entomologist, Indian Central Sugarcane Committee, in the detailed survey plots of the 1958-59 crop in Rajadanikottah, Pugalur, Gudiyatham, Cuddalore and Lakshmangudi, the post monsoon and harvest counts were recorded.

*General Survey*.—The general pest position in the districts of Coimbatore, Madurai, Tanjore, Tiruchirappalli, North Arcot and South Arcot were recorded. *Chilo-traea infuscatella* S, *proceras indicus* K, *Seripophaga nivella* F. *Targionia glomerata* G. and *Aleuolobus barodensis* M. were prevalent in these districts.

IV. *Grow More Food Scheme—Plant protection scheme*.—During the year the plant protection wing was divided into two zones—the southern comprising of districts of Thanjavur, Tiruchirappalli, Madurai, Ramanathapuram, Tirunelveli and Kanyakumari with headquarters at Thanjavur and the Northern comprising of Chingleput, North Arcot, South Arcot, Salem, Coimbatore and Nilgiris districts with headquarters at Coimbatore. Useful assistance was rendered to ryots by this organisation. A total of 8,01,038-80 ac. and 2,51,067 trees were treated during the period under report the Northern comprising of Chingleput, North Arcot, South Arcot, Salem Coimbatore and Nilgiris districts with headquarters at Coimbatore. Useful assistance was rendered to ryots by this organisation. A total of 8,01,038-80 ac. and 2,51,067 trees were treated during the period under report the value of the produce served being Rs. 189.16 lakhs.

V. *Miscellaneous—on Fumigation*.—Consignment of seed materials intended for storage by various specialists were fumigated and rendered pest free.

(b) *Phyto-sanitary certificates*.—Twenty-four consignments of seeds and other planting material intended for despatch to foreign countries were fumigated and necessary certificates issued.

(c) *Pest forecasts*.—Weekly pest forecasts were prepared from the different districts and sent to the Director of Agriculture, Madras, Station Direction, All-India Radio, Tiruchirappalli and Madras; all Deputy Directors of Agriculture, District Agricultural Officers of the Madras State and Crop and Plant Protection Officers, Coimbatore and Thanjavur.

(d) *Work done in collaboration with the Agricultural Meteorologist*.—Weekly observations on the incidence of pests of ragi, cotton cholan and groundnut crops were made and the data furnished to the Agricultural Meteorologist.

VI. *Steps taken for the dissemination of results of research and the economic benefit to the ryots*.—Findings of practical utility and economic importance are being transmitted to the Plant Protection Organisation for adoption. Pest control problems are discussed at the Farmers' Day Celebrations and popular articles on important topics are published in Grow More Food journals, for the benefit of the farmers.



## 4. AGRICULTURAL MYCOLOGY.

1. *Rice Blast*—(a) *Varietal resistance trials*.—Sixty-five rice cultures comprising 24 long duration 26 medium duration and 15 short duration cultures were tested for their relative resistance to blast disease in randomized replicated field experiments. ADT. 10 and Co. 13 varieties were used to serve as susceptible controls in the various varietal experimental plots. The incidence of the disease was however low and the performance of different cultures could not be assessed properly. The results in respect of grain yield were however, found to be significant in all the three series and some of the cultures have recorded significant increase in grain yield over the control.

(b) *Fungicidal trial*.—The relative efficacy of eleven proprietary fungicides was tested in the control of blast disease in a randomized replicated field experiment. ADT. 10, Susceptible variety, was used in the experiment. The fungicides were applied in the form of spray or dust twice during the growth period of the crop. The incidence of the disease in this experiment also was not of sufficient magnitude as to draw any definite conclusions. But the yield records in some of the treatments have shown 25-30 per cent increased grain yield over unsprayed control.

2. *Seed borne fungi of cereals*—*Ragi* (*Eleusine coracana*).—The effect of various seed borne fungi associated with ragi seeds on seed germination at various levels of humidity was assessed under laboratory and pot culture conditions. Seeds treated with various fungi and fungicides and stored at high humidity level (95 per cent) were found to deteriorate rapidly and there was complete failure of germination within about four months. Similarly treated seed but stored at lower humidity levels (55 and 75 per cent) were found to be almost normal in their germination. The germination in trays under laboratory conditions was always found to be about 10-15 per cent higher than that obtained in soil under pot culture conditions. Similar finding has also been noticed in the case of cholam seed in previous years. Studies are in progress with seed borne fungi associated with paddy seeds.

3. *Cotton black-arm*.—Fourteen cultures of cotton were tested for their relative resistance to black-arm infection in randomized replicated plots. The crop was artificially inoculated by spraying bacterial suspension so as to induce infection. Among the cultures tested only one culture 2,196 exhibited considerable resistance to the disease under field conditions.

The control of black-arm infection by the application of Antibiotics was assessed in a field experiment at the Agricultural Research Station, Bhavanisagar. The cotton variety MCU. 1 was used in the experiment. The incidence of the disease was found to be low, and the efficacy of different treatments could not therefore be assessed. The yield records taken have, however revealed

that higher yields ranging from 12.2 to 17.5 per cent over control were obtained in the case of plots treated with Streptomycin, Agrimycin and Bordeaux mixture.

4. *Alternaria leaf spots of solanaceae*.—*Alternaria* spp. from different solanaceous hosts, viz., tomato, brinjal, tobacco, potato, chillies and datura were isolated. Pathogenicity tests carried out have shown that all of them were pathogenic on their own respective hosts. The cross inoculation tests carried out so far have revealed that the isolate from potato passed on to tomato, chillies and datura. The brinjal isolate was found to infect only chillies and tomato.

5. *Anthraxnose of leguminosae*.—The studies on this group of diseases were continued further. The isolate of *Colletotrichum* obtained from groundnut was identified as *C. mangenoti* and the one from lima bean as *C. lindemuthianum*. The optimum pH levels for the various isolates of *Colletotrichum* from different leguminous host plants were determined. It was observed that various isolates were found to require different optimum pH level for maximum growth and sporulation. The inoculation tests carried out with different isolates on various hosts have shown that most of the isolates infected wounded seedlings of the host plants. All the isolates failed to infect both unwounded and wounded seedlings of *Prosopis*.

6. *Anthraxnose of banana*.—The studies on anthraxnose of banana was also continued further. The optimum temperature for most of the isolates of *Gloeosporium* was found to be 25°C. Studies to determine the optimum pH have shown that a pH of about 5.5 was found to be conducive to good growth. But the optimum pH for sporulation, however, was found to be varying with different isolates.

The activity of the protopectinase enzyme of the different isolates was assessed using potato tuber discs and banana fruit peels. It was observed that the activity of the enzyme varied with different isolates of *Gloeosporium*. The maximum activity of the enzyme was noticed with three days incubation in the pectin asparagin medium without calcium carbonate.

The effect on various carbon and nitrogen sources on the growth and sporulation of different isolates were studied. Galactose was found to support poor growth while Amylum was found to favour good growth of most of the isolates. Among the various nitrogen sources tried peptone and asparagin were found to support good growth and sporulation of all the isolates. Ammonium sulphate was found to produce minimum sporulation of the isolates in comparison with other nitrogen sources.

7. *Banana wilt*.—An observational trial was laid out in Central Farm wet lands to test the effect of flooding for six months on the

infective ability of the wilt pathogen in a wilt sick plot. The observations recorded have shown the absence of the fungus from the rhizomes of banana plants. The experiment is still in progress.

8. *Coconut wilt*.—The prevalence of wilt disease of coconut caused by *Ganoderma lucidum* was observed in the districts of North Arcot and Chingleput. The affected areas were inspected and diseased material from different areas have been collected for isolating the casual agents and further study.

9. *Pythiaceous fungi*.—The relative efficacy of different fungicides and antibiotics on the growth of soil borne fungi like *Pythium aphididermatum* and *Phytophthora* sp. was assessed under laboratory conditions in the agar medium. The results have indicated that the antibiotics were not effective in arresting the growth of *P. aphididermatum* while Cerenox ESD/AM and ESD/HS inhibited the growth of the fungus to a marked extent. In the case of *Phytophthora* only one fungicide, viz., Copper acetyl acetone at 1,000 ppm inhibited the growth of the fungus and some of the fungicides were found to be fungistatic at 2,000 ppm.

A fungicidal experiment for the control of pre-emergence damping off of brinjal and tomato was carried out under pot culture conditions. The various fungicides and chemicals were applied as seed dressings prior to sowing the seed and also as drenches in the soil. The seed treatment trials showed that Cerenox at the rate of 3 gm. per pound of seed was significantly superior to other treatments in the case of brinjal while ESD/AM was found to be the best treatment followed by Cerenox in the case of tomato. In the drenching trials dithane followed by bordeaux mixture gave the best results in brinjal while bordeaux mixture followed by flit was found to be the best in the case of tomato. Among the various liquid media tried for the best growth, of *Pythium aphanidermatum* maize meal and French bean were found to be superior to other media.

10. *Virus diseases of pulses crops*.—Most of the pulse crops grown at the Millets Breeding station like greengram, blackgram, cowpea, redgram, etc., were found to be affected by mosaic (virus) in varying degrees. The transmission of this group of disease on these crops by grafting, insect vector, dooder and other method of transmission are being tried.

11. *Studies on nitrogen fixing blue green algae*.—The growth of *Tolypothrix Tenuis* in various media was tried and Watanabe's medium was found to be the best. The growth of some indigenous algae, viz., *Oscillatoria*, *Nostoc*, *Gloeocapsa* and *Rivularia* was found to be satisfactory in straw infusion within a month.

The effect of addition of *T. tenuis* to paddy soil on the yield of rice was tested under pot culture conditions. The results have shown that addition of algae has markedly increased the grain yield.

An Indian Council of Agricultural Research Scheme on nitrogen fixing blue green algae has started functioning since 10th March 1960.

12. *Stem rot of rice—Varietal resistance trials*.—Forty-nine cultures and types of rice were tested under field conditions for their relative resistance to stem rot infection. As there was low incidence of the disease in the experimental plots no conclusion could be drawn. A field experiment was conducted to test the effect of application of nitrogenous manures on the incidence of stem-rot infection. The results showed that increased incidence of the disease was noticed with increase in the levels of nitrogen applied.

The fungicidal control of the disease by the use of various fungicides has shown that wet ceresan applied thrice during the crop period was found to be the best treatment in the control of the disease.

13. *Vegetable diseases—Tomato*.—A field experiment on the fungicidal control of 'damping off' was laid out with various fungicides. Among the various fungicides tested dithane Z-78 was found to be best followed by bordeaux mixture and cupravit. No difference could be noticed between raised and level beds.

*Tomato early blight*.—Five fungicides, viz., bordeaux mixture, flit-406, cupravit, dithane Z-78 and copper acetyl acetone were tested for the control of early blight diseases. All the fungicidal treatments have recorded reduced incidence than the untreated control.

*Gourds*.—The efficacy of four different fungicides in the control of downy mildew in gourds was tested in a field experiment. The incidence of the disease as well as the yield in the treated plots were better than the untreated control but the results were not statistically significant.

*Virus diseases*.—The control of virus diseases on the vegetable crops by the application of various insecticides for controlling insect vectors was tried. All the plots treated with various insecticides gave higher yield and reduced disease incidence although the results were not statistically significant.

An Indian Council of Agricultural Research Scheme for the investigation of fusariase wilts of solanaceous vegetables has started functioning since 11th April 1960.

14. *Betel-vine wilt*.—The fungicidal control of the disease was tested in a field experiment with eleven fungicides. Among the various fungicides tested, bordeaux mixture was found to give reduced wilt incidence. The highest leaf yield was recorded in the plots treated with dithane Z-78 followed by Bordeaux mixture.

treated plots. The irrigation trials have revealed that beds receiving irrigation once in two days have recorded less incidence of wilt than other treatments. The experiments are still in progress.

15. *Fungicidal co-ordinated trials.*—The fungicidal trials carried out have shown that spraying bordeaux mixture reduced blast incidence and the grain yield was also found to be more than the other fungicides tested.

16. *Soil microbiology.*—The effect of application of weedicides, viz., 2, 4-D and Extar-A, to the soil on the soil microflora was studied. It was observed that application of 2, 4-D at the rate of 10 lb. per acre is toxic to bacteria and this finding was in conformity with the previous results. There was non-significant change in the soil microflora by the application of Extra A to the soil.

*Biological changes in paddy soils.*—The moisture content of the soil gets significantly reduced from the period of crop growth to the period of preparatory cultivation and then to the fallow period. There is a sudden spurt of microbiological activity when water is let in the dry fields for preparatory cultivation. The total bacterial population, the carbondioxide evolved and the number of nitrogen fixing bacteria appear to be positively correlated with the moisture content of the soil.

*Supply of legume bacterial cultures.*—A scheme for the distribution of bacterial cultures of different legumes to the various Block Development Officers was implemented with a view to popularize the use of bacterial cultures. About 150 flasks have been supplied so far to the various Block Development Officers.

The particulars regarding the area covered and the savings effected by the adoption of the various plant protection measures are furnished in the table below :—

|                                            | ACRES.  | TONS.       |
|--------------------------------------------|---------|-------------|
| Rice .. .. .                               | 138,800 | 4,960       |
| Millet .. .. .                             | 15,000  | 535         |
|                                            |         | RUPEES.     |
| Other crops (vegetables, cash crops, etc). | 75,000  | 1,32,00,000 |
| Number of trees and plants treated ..      | 13,000  | 2,60,000    |

The above figures do not include the natural spread of control measures and the spread of resistant varieties such as Co. 25 paddy, Co. 449, sugarcane.

## 5. AGRICULTURAL METEOROLOGY.

*Main lines of research pursued in the section.*—(i) Meteorological data in the observatory and microclimatic data in the open as well as in the crop fields were collected daily at 07.00 hours and 14.00 hours as per schedule.

(ii) Crop-weather experiments were conducted in three Agricultural Research Stations on the crops as detailed below :—

- (a) Coimbatore—Paddy, cotton and cholam;
- (b) Aduthurai—Paddy (kuruwai and samba); and
- (c) Koilpatti—Cotton and cumbu.

Detailed observations were recorded on the above crops as per the technical programme drawn up by the Director of Agricultural Meteorology, Poona, on an all-India basis. The observations on pests and diseases were recorded along with the data on weather conditions in order to study the influence of weather on the incidence of pests and diseases on the above crops. Exhaustive data on soil moisture were collected with regard to the observatory and crop fields. The data were regularly submitted to the Director of Agricultural Meteorology, Poona.

(iii) The Agricultural Meteorologist functioned as a member of the Sub-Committee constituted by the Government of Madras, for conducting artificial rain-making experiments. The experiments were conducted at Agricultural College and Research Institute, Coimbatore, as per programme during the period under report.

*Statistical analysis.*—(a) Crop particulars with reference to the cold-weather gingelly TMV. 2, raised at the Agricultural Research Station, Tindivanam, were collected and analysed with reference to rainfall and cumulative temperature during the different growth phases of the crop. There is a positive association between the yield of gingelly TMV. 2 and the cumulative mean diurnal temperature during the first fortnight after the sowing of the crop. Regression equations were worked out to forecast the yield of this crop, with a fair degree of success.

(b) The influence of weather on the yield of summer gingelly TMV. 3 raised at the Agricultural Research Station, Tindivanam, was studied. It was found that the conditions which were congenial during the growth phase of the crop were completely reversed in the flowering phase and that prolongation of flowering phase inhibited the yield of the crop. The tentative findings were incorporated in a paper presented to the Ninth Scientific Workers' Conference of the Agricultural College and Research Institute.

(c) The response of paddy Co. 25 to the rainfall received during its different growth phases at Coimbatore was studied. The study revealed that the rainfall and number of rainy days occurring during the second and third weeks before the flowering of the crop have a beneficial influence on the yield. Regression equations were worked out to forecast the yield of the crop with a fair degree of success.

(d) Detailed particulars regarding the growth and yield of sugarcane at Sugarcane Research Station, Gudiyatham, were collected from the station reports for the period 1935-36 to 1957-58.

(e) The data of maximum temperature pertaining to Agricultural Research Station, Nanjanad, for 27 years from 1932 to 1958 were analysed statistically.

(f) The data on the "studies on the effect of growth regulators on potato", conducted at the Potato Breeding Station, were statistically analysed.

(g) The data on the variation of soil temperature at 3 inches, 6 inches and 12 inches depths for every two hours were compiled from the soil-thermograph charts.

(h) The evaporation data, from different evaporimeters were compiled to study their relative evaporation.

(i) The rainfall data pertaining to the Sugarcane Research Station, Gudiyatham, were compiled and analysed to study the pattern of rainfall. A paper entitled "Monsoons at Gudiyatham" was sent for publication in the "Madras Agricultural Journal".

(j) The seasonal distribution of rainfall for nine-recording stations in the Nilgiris district was computed from 57 years' data for cold-weather, hot-weather, monsoon and post-monsoon periods and a revised paper entitled "Study of certain aspects of rainfall over the Nilgiris" was sent for publication in the "Indian Journal of Meteorology and Geophysics".

(k) The nature of cloud formations and the rainfall received at Coimbatore were studied and tabular statements for the South-West monsoon, for the period 1954 to 1959 were prepared on the basis of fully laden and spent-out clouds, to test the efficacy of the seedling trials.

(l) In order to study the influence of weather on the yields of paddy, Swarnawari, Samba and Navarai crops raised at the Agricultural Research Station, Tirurkuppam, detailed particulars were culled out from the available station reports.

(m) The data on minimum temperature of the Agricultural Research Station, Nanjanad, were compiled and computed for statistical analysis.

(n) The quantity of dew formation at Coimbatore is being statistically analysed with reference to meteorological data.

(o) The available meteorological data of rainfall, maximum temperature, minimum temperature and humidity, pertaining to the Agricultural Research Station, Tirurkuppam, was compiled.

(p) The daily rainfall data from 10 rain-recording stations situated round about Agricultural College and Research Institute were collected and compiled to study the distribution of rainfall.

(q) In order to study the influence of weather on the incidence of pests and diseases on paddy, detailed particulars of their incidence on each of the three crops, raised at Agricultural Research Station, Tirurkuppam, were compiled from the Station reports.

(r) The incidence of Tikka leaf-spot disease on groundnut TMV. 2 at Coimbatore was studied in relation to microclimate. The results were not conclusive as the data collected for five years is too meagre for the statistical analysis.

(s) Studies in collaboration with the Government Entomologist and Government Mycologist, Coimbatore, in the prediction of outbreak of pests and diseases on crops.—(a) Daily microclimatic observations and weekly pests and diseases observations were recorded on the four irrigated crops of groundnut, ragi, cholam and cotton, in order to assess the relationship between weather and the incidence of pests and diseases on crops.

(b) Monthly reports on the incidence of pests and diseases on the major crops, estimated by eye-observations, from nine Agricultural Research stations were compiled.

(vi) Detailed observations regarding height, number of leaves and number of internodes were recorded at weekly intervals on selected plants of Co. 1 and Co. 19 cholam, in order to study the influence of weather on the growth of cholam.

(vii) The Agricultural Meteorologist functioned as a member of the Wind-power Survey Committee, constituted by the Government of Madras.

(viii) The Agricultural Meteorologist functioned as a member of the Advisory Committee on Rain and Cloud Physics Research Unit of the Council of Scientific and Industrial Research, New Delhi, and attended two meetings at Delhi in this connection.

## 5. BOTANY.

I. *Identification, economic enquiries, etc.*—Over 10,000 specimens were either identified or confirmed for the II B.Sc. (Ag.) students who are required to submit plant collections for the University Examinations. Besides the above, about a hundred specimens were identified for the departmental officers, other Colleges, Universities and private correspondent.

During the period, 81 economic enquiries were answered relating to fodder grasses, legumes, soil conservation plants, medicinal plants and related subjects.

Besides a number of enquiries on grasses, legumes, etc., two enquiries on identification of species of grasses, one from Bangalore and the other from the Superintendent, Agricultural Research Station, Pattukkottai, were attended to.

In response to numerous enquiries for the supply of seeds and slips of promising grasses for fodder, the following supplies were made, both to the Government department and to the public:—

Total quantity of seed supplied during the year—102.00 lb.

Total quantity of grass supplied—13,500 slips.

**II. Research—Botany (Main).—**(1) Observations on the growth, flowering and fruit set of ornamental trees, shrubs and climbers:

The phenological observations on flowering, fruit-set, leaf fall, etc., of ornamental trees, shrubs and climbers confirmed the findings of previous years and also enabled to classify these plants into groups bringing out the important blooming periods and the species suited for each blooming period.

(2) *Studies on soil conservation plants.*—The studies on soil conservation plants resulted in determining the suitability of six species of grasses five legumes and two non-leguminous plants suited for the purpose.

(3) *Studies on Aquatic plants and their utilization as nitrogen fixers for paddy.*—Studies on the utilization of algae for nitrogen fixation showed that, nitrogen-free distilled water containing sodium molybdate (250 ppm to 500 ppm) is suitable for culturing species of *Cylindrospermum*.

(4) *Pre-treatment of grass seeds for improving germinations.*—The pre-treatment of seeds of *Cenchrus ciliaris* and *C. Setigerus* indicated some increase in respect of certain strengths of potassium nitrate and potassium sulphate. The above seeds possess dormancy for a period of one year, and pre-treatment with potassium nitrate and potassium sulphate is being tried to break the dormancy of seeds.

(5) *Studies on the germination and dormancy of some South Indian vegetable seeds.*—Dormancy studies on vegetable seeds show that there is no dormancy in tomato, pumpkin, brinjal and amaranthus. Variation, however, occurred in germination percentage of these seeds depending on the location of collection. Bhendai and ribbed gourd recorded an initial germination of 94 per cent and 86 per cent respectively, indicating thereby the absence of dormancy. The germination capacity for the above centred around 90 per cent bhendai and 70 per cent for ribbed gourd.

(6) *Studies on the introduction and acclimatization of economic plants and their relatives.*—Seeds and plant materials of 87 species were obtained from abroad and other parts of India during this period. Two grasses, viz., *Stenotaphrum secundatum*, *Arrhenatherum elat* and the true cork tree *Quercum suber* have established well and are making satisfactory growth.

(7) *Germination studies with flowering annuals.*—Germination studies with flowering annuals revealed that seeds of balsam and *Celosia* can be stored for a period of two years or over, without deterioration in germination. Seeds of *Zinnia*, *Cosmos*, *Gaillardia*, *Marigold* and *Hollyhock* were tested for their germination capacity in sand as well as filter paper media, to establish the variation that can be expected between laboratory tests and actual germination in the field. The majority of the species variation was seen between the two methods, the germination being generally less in sand. The data for few species are presented below:—

| Species.           | In filter paper. | In sand.  |
|--------------------|------------------|-----------|
| (1)                | (2)              | (3)       |
|                    | PER CENT.        | PER CENT. |
| Zinnia .. .. .     | 70 to 83         | 5 to 60   |
| Cosmos .. .. .     | 55 to 56         | 6 to 45   |
| Gaillardia .. .. . | 5                | Nil.      |
| Marigold .. .. .   | 9 to 57          | 3 to 57   |

(8) *Studies on minor crops—Umbelliferous plants and Trigonella species.*—Preliminary observations with minor crops (umbelliferous plants and *Trigonella*) suggest the possibilities of isolating high yielding strains by pureline selection in *Coriandrum Sativum* and *Trigonella Foeniculum-goeum*. Among the 14 types of *Trigonella fœnum-græcum* A.C. 883 and 878 proved to be vigorous and appear to be promising.

(9) *Longevity studies of seeds and propagules of weeds.*—Fortnightly germination tests of seeds of three weeds, viz., *Trianthema portulacastrum*, *Acanthospermum hispidum* and *Lchnochloa colona* were conducted in filter paper and sand. This was with a view to determine the dormancy and longevity of the above seeds. Uniform sized stolons of *Cynodon dactylon* were collected and stored under suitable conditions for conducting similar longevity and dormancy studies.

(10) *Induction of mutations in common flowering and foliage shrubs of the plains.*—Rooted plants of crotons were treated with 0.2 and 0.4 per cent colchicine solutions, and 0.2 and 0.4 colchicine in lanoline medium used as a paste. The above treatment for three days was injurious; hence it was reduced to one day and results being watched.

(11) *Economic Botany and acclimatization trials—*(i) *Green manure plants.*—The following green manures, viz., *Tephrosia noctiflora*, *Indigofera oblongifolia*, *sesbania kirkii*, *Cassia lesche-*

*naultiana*, *crotalaria juncea* (local and Southern Rhodesia), *Crotalaria browneri*, *Crotalaria Verrucosa*, *Cassia angustifolia*, *Sesbania aculeata* and *Sesbania speciosa* are being maintained. From the preliminary studies laid out under wetland conditions to compare the performance of different green manures as *Sesbania speciosa*, *Sesbania aculeata*, *Crotalaria juncea*, and cluster beans CP. 78 with the new *Sesbania Kirkii*, it is observed that *Crotalaria juncea* gives the maximum yield of 32,670 lb. per acre followed by *Sesbania speciosa*, the yield being 27,225 lb. per acre after 45 days of sowing. *S. Kirkii* is very vigorous in growth and in 45 days has reached fruiting while the rest are in vegetative phase. Possibility of *S. Kirkii* as a very short duration green manure plant is being investigated.

(ii) *Fibre plants*.—A good collection of blast-fibre and leaf-fibre plant is maintained in the Botanical Gardens, Coimbatore, and fibre extraction from these plants was tried.

(iii) *Essential—Oil yielding plants*.—A live collection of Cymbopogon species from various parts of the country is being maintained in the Botanical Gardens, Coimbatore, besides a similar collections of *Vetiveria Zizanoides*. *Bursera delpechiana* was also tried in the Botanical Gardens.

#### 7. CYTOGENETICS.

The progeny of the diploid asynaptic Sorghum ( $2n:30$ ) crossed with the halepense-durra hybrid ( $2n:30$ ) were found to be 40-Chromosomed. The external morphology of the plants and cytology indicated their hybridity, involving the fusion of two 20-Chromosomed gametes from each parent. The plants obtained by selfing the asynaptic diploid, were all found to be autotetraploids in origin and asynaptic.

A selected allotetraploid *Pennisetum* ( $2n:28$ ) produced two 42 and one 28-Chromosomed plants on selfing, two 28 and one 42-Chromosomed plants on pollination with autotetraploid *Pennisetum typhoides* and one 35-Chromosomed plant on pollination with diploid *P. typhoides*. The genomic constitutions of these seven derivatives of the allotetraploid have been analysed.

A 45 and a 38-Chromosomed plants were raised from an open pollinated quadruple monosomic *Pennisetum purpureum* ( $2n:24$ ). Based on the meiotic associations of these plants, have genomic constitution as well as their mother plants have been analysed.

The course of meiosis in the allotriploid ( $2n:36$ ) hybrid between auto-tetraploid *Oryza sativa* ( $2n:48$ ) and *O. perennis* ( $2n:24$ ) was studied. The investigation has brought out the similarity of the Chromosome complement of *O. Perennis* with that of *O. sativa*.

The study of chromosome numbers of hybrids ( $2n:44$ ) of banana involving the triploid ( $2n:33$ ) and diploid ( $2n:22$ ) as parents in eight sets of crosses revealed that unreduced gametes of the triploid parent have functioned.

Chromosome numbers for nine cultivated varieties of grapes and seven wild species belonging to four genera (*Ampelocissus*, *Tetragstigma*, *Cissus*, *Leea*) were recorded for the first time.

#### 8. PLANT PHYSIOLOGY.

The main items of research were foliar nutrition of crops plants with micromutrients and weed control by herbicides.

*Foliar nutrition*.—Pot culture and field scale studies were made on GEB. 24. The foliar salt solutions were those of urea, ammonium phosphate, super and potassium phosphates. Significant increases in plant height and straw yield were recorded. The grain yield increases failed to reach the level of significance. The studies are being continued. The results are promising.

*Weed control*.—The effect of Iso-Cornox (1 per cent) on *Solanum elaeagnifolium* was studied in an observational trial. The efficacy in eradication was not quite appreciable as only the shoot portions were killed and there was regeneration after six months.

Five per cent Iso-Cornox was somewhat effective on *Cyperus rotundus* but not quite so on *Cynodon dactylon*. The studies are being continued.

A comparative study of various new herbicidal chemicals on these two notorious weeds is in progress at the pot culture house.

#### 9. SCHEME ON FODDER RESEARCH.

The approved programme for the scheme was carried out during the year as detailed below under various items:—

(1) *Maintenance and preliminary studies on grasses and legumes*.—During the year, 69 species of grasses and legumes were introduced and tried in garden as well as dry land conditions. The promising introductions were *Arrhenantherum elatius* (Tulatin tall coat grass) from the United States. *Stenotaphrum secundatum*, also from the United States, *Brachiaria purpurescens* from Brisbane, *Glycine Javanica* (variety Behuna white) from Southern Rhodesia and *Cenchrus ciliaris* (six types) from West Bengal. These are under further study.

(2) *Character studies*.—In a study to find out the effect, if any, on the viability of seeds collected from the different seasons for the year with seeds of *Cenchrus ciliaris*, *C. Glaucus* and

*panicum antidotale*, it was observed that the data so far collected did not give any indication of any seasonal influence.

In a study on the response to cutting and regeneration in the two grasses *Panicum maximum* and *Pennisetum purpureum*, it was seen that *Panicum maximum* is superior to *Pennisetum purpureum* from the point of view of the number of tillers produced and also that certain months of the year had a significant favourable effect as compared to the other months, in the production and weight of tillers.

(3) In the Manurial trial with five grasses and nine manurial treatments, it was observed that *Cenchrus glaucus* was the most responsive grass for manurial treatments, the different grasses required different manurial treatments for optimum yields and that all the grasses required an organic basal dressing such as Farm yard manure for increased yield.

(4) In a study with promising leguminous fodders of short duration, for introduction in the existing garden land rotations, during the fallow period, it was seen that sunnhemp and pillipesara were best suited for the purpose and that the latter was preferable to the former, since it gave larger quantity of fodder per acre, in addition to having a beneficial effect on the succeeding cholam crop, as reflected by an increase of 35 per cent in straw yield.

(5) In a study on the comparative yields of perennial fodder grasses in garden and dry-land conditions, it was observed that *Pennisetum purpureum* under garden land and *Cenchrus glaucus* under rainfed condition gave the highest yield of fodder.

(6) In a study of the combination of grasses and legumes under dry condition, it was observed that Sorghum and *Pennisetum pedicellatum* with cowpea as the legume component gave the maximum yield of fodder.

#### 10. SCHEME ON CYTOGENETICS OF WILD GRASSES AND BREEDING THEM FOR SELECTION OF FODDER AND FORAGE GRASSES.

There are over a hundred genera of grasses indigenous to the Madras State. The object of the scheme is to collect and undertake cytogenetical studies in the indigenous grasses suitable for fodder purposes and improve them by interspecific hybridization and selection.

*Collection, identification and maintenance of grasses.*—A total of 20 species belonging to 17 genera of grasses have been added on to the existing collection. They were identified with the help of authenticated sheets available in the Herbarium at Coimbatore. Specimens of live plants were also pressed for preparation of Herbarium sheets.

| Name of genera.           | Number of species. |
|---------------------------|--------------------|
| (1) Andropogon ... ..     | 1                  |
| (2) Apluda ... ..         | 1                  |
| (3) Arundo ... ..         | 1                  |
| (4) Chionachne ... ..     | 1                  |
| (5) Chrysopogon ... ..    | 2                  |
| (6) Cymbopogon ... ..     | 1                  |
| (7) Eleusine ... ..       | 1                  |
| (8) Eragrostis ... ..     | 1                  |
| (9) Heteropogon ... ..    | 1                  |
| (10) Paspalum ... ..      | 2                  |
| (11) Pennisetum ... ..    | 1                  |
| (12) Pseudosorghum ... .. | 1                  |
| (13) Rottboellia ... ..   | 1                  |
| (14) Sehima ... ..        | 1                  |
| (15) Setaria ... ..       | 1                  |
| (16) Sorghum ... ..       | 2                  |
| (17) Themoda ... ..       | 1                  |

A comparison of the morphological characters of *Panicum maximum* (Guinea grass) obtained from Marudamalai (2n:32) revealed that it is smaller in height, leaf size, stem thickness and Panicle length compared to the type obtained at the Central Farm, Coimbatore (2n:36). However the Marudamalai form had more tillers than the Central Farm type. The plants are being multiplied for conducting preliminary yield trials for fodder.

*Study of cytology of grasses collected and interspecific crosses.*—The haploid chromosome numbers of 21 collections comprising 19 species belonging to 15 genera and three plants out of the cross *C. ciliaris* × *Blou Buffel* have been determined.

| Name of species.                                          | Chromosome number. | Remarks.                                                                                 |
|-----------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------|
| (1)                                                       | (2)                | (3)                                                                                      |
| 1 Apluda varia Hack Fodder Research Officer.              | 30                 | 30 II at Metaphase I.                                                                    |
| 2 Apluda varia Hack Fodder Research Officer, Arakuvalley. | 32                 | 32 II at Metaphase I 1-2 IV Occasional.                                                  |
| 3 Apluda varia Hack Fodder Research Officer, Topalip.     | 10                 | 10 II at Metaphase. I                                                                    |
| 4 Bothriochloa Intermedia .. ..                           | 20                 | 20 II at Metaphase I.<br>3 IV plus 14 II; 2 IV plus.<br>16 II; IV Plus 18 II occasional. |



| <i>Names of species.</i>                                                   | <i>Chromosome number.</i> | <i>Remarks.</i>                                      |
|----------------------------------------------------------------------------|---------------------------|------------------------------------------------------|
| (1)                                                                        | (2)                       | (3)                                                  |
| 5 <i>Brachiaria Purpurescens</i> .. ..                                     | 18                        | 18 II at Metaphase I.                                |
| 6 <i>Cenchrus setigerus</i> vahl .. ..                                     | 18                        | 18 II at Metaphase I, 1-2 IV Occasional.             |
| 7 <i>Chionachne Keenigii</i> .. ..                                         | 11                        | 11 II at Metaphase I.                                |
| 8 <i>Chionachne semiteres</i> C. Fisch .. ..                               | 10                        | 10 II at Metaphase I.                                |
| 9 <i>Chrysopogon asper</i> Heyne .. ..                                     | 10                        | 10 II at Metaphase I.                                |
| 10 <i>Chrysopogon verticillatus</i> trin .. ..                             | 10                        | 10 II at Metaphase I.                                |
| 11 <i>Cymbopogon caesioides</i> stapf .. ..                                | 11                        | 11 II at Metaphase I.                                |
| 12 <i>Eriochloa procera</i> C.E. Hubb .. ..                                | 18                        | 18 II at Metaphase I.                                |
| 13 <i>Panicum maximum</i> Jacq. Ca. .. ..                                  | 16                        | 16 II at Metaphase I 1-2 IV Occasional.              |
| 14 <i>Paspalum conjugatum</i> Berg .. ..                                   | 20                        | 20 II at Metaphase I.                                |
| 15 <i>Pennisetum hohenackeri</i> Hochst .. ..                              | 9                         | 9 II at Metaphase I.                                 |
| 16 <i>Pennisetum polystachyon</i> Sch .. ..                                | 27                        | 27 II Metaphase I.                                   |
| 17 <i>Pseudosorghum fasciculare</i> A. Comus .. ..                         | 10                        | 10 II at Metaphase I.                                |
| 18 <i>Rottboellia exaltata</i> L.F. .. ..                                  | 10                        | 10 II at Metaphase I.                                |
| 19 <i>Sorghum halepense</i> pers .. ..                                     | 20                        | 20 II at Metaphase I 1-2 IV occasional.              |
| 20 <i>Sorghum nitidum</i> pers .. ..                                       | 5                         | 5 II at Metaphase I.                                 |
| 21 <i>Themeda quadrivalvis</i> O. Kt. Ca. .. ..                            | 20                        | 20 II at Metaphase I 1-2 IV occasional.              |
| 22 <i>C. ciliaris</i> × Blou Buffel .. ..<br>(Africa n = 18) (Blue n = 19) | 18                        | 18 II at Metaphase I 1-2 IV occasional.              |
| 23 <i>C. ciliaris</i> × Blou Buffel .. ..<br>(n = 18) (green n = 21).      | 27                        | Associated in IIIs, IIs and Is-maximum trivalents 5. |
| 24 <i>C. Ciliaris</i> × Blous Buffel .. ..<br>(n = 18) (green n = 21).     | 18                        | 1-2 IV. 14-16 II: occasional 1-2 Univalents rarely.  |

Meiosis is regular in all the above species unless specifically mentioned.

*Study on the extent of seed sterility.*—The pollen sterility of *Chionachne Koenigii* was found to be 26.72 per cent. However the seed sterility of the plant was very high, i.e., 99.3 per cent. The nature of seed sterility in this species is being investigated. Considerable seed sterility existed in several of the grasses studied.

1. *Paspalum dilatatum*—Ootacamund and Singampatti about 95 per cent.

2. *Panicum maximum*—Marudamalai, Central Farm and Yercaud, about 50 per cent.

3. *Cenchrus ciliaris*, about 50 per cent.

4. *Cenchrus setigerus*, about 50 per cent.

*Hybridisation.*—Three plants derived from the cross of *C. ciliaris* (N-18) × Blou Buffel (Green n-21) have been determined for their chromosome number. One was found to be a triploid

n-27 of maternal origin and two others had the same chromosome number (n-18) as the mother. The study indicated the occurrence of apomixis in *C. ciliaris* confirming the observation of foreign workers. Interspecific hybridisation was resorted to in *Coix lacrimajobi* (n-10) and *Coix gigantea* (n-20). The former has broader leaves and thicker stems and the latter is more hairy and taller. Both are perennial types. The anthesis occurs between 8-30 to 10 a.m. in both the species. The male flowers were removed and the female flowers bagged before the emergence of the stigma. The pollen was collected by 9-00 a.m. and dusted on to the stigma immediately after. The reciprocal crosses have also been attempted. Majority of the female spikelets dusted failed to develop seeds. Attempts at hybridisation between *Chionachne koenigii* and *Chionachne Semiteres* have also been made.

#### 11. AGRONOMY.

(a) *Summary of Research work done.*—In the experiment to study the combined effects of tillage, manures and irrigation on the garden land crops, the yield of cholam crop was not influenced by any of the treatments, the yield of cotton crop also was not affected by any of the three treatments, though the interaction between irrigation and tillage was just significant.

In the garden land rotation experiment, in one series there was no difference in yield of cotton either with a green manure crop or without. The cholam grain yield was significantly higher in the rotation I including a green manure crop and straw yield was higher in rotation II without a green manure crop. The yields of ragi, cotton and green manure in rotation II were not significant.

In the tillage-cum-manure experiment on wet land rice under the Central Farm conditions 60 lb. in each of N., P205 and K20 have given the best results and it was not economical to apply higher doses. Tillage had no effect on yield of grain or straw.

In the availability of phosphate experiment, all the different methods of application were alike in their influence on yield of paddy.

In the experiment to study the nature and uptake of phosphate by legumes conducted for the second year, the effect of manures on the legumes was not significant. There was neither significant increase in the yield of legumes nor the yield of subsequent crop of paddy was affected in two centres, viz., Coimbatore and Tirurkuppam. In Aduthurai, the legume (Kolingi) was found to be distinctly superior to pillipesara and sesbania.

In the soil survey scheme 56 soil samples were collected and analysed. A soil map of the North Arcot district was prepared.



In the second year of the scheme for the study of chemical investigation of the cause of blast resistance in paddy, neither the forms of nitrogen nor the levels and combinations of nitrogen and potash had any significant influence on the intensity of disease infection.

In the scheme for the fertiliser control order, out of 456 samples received, 310 samples were analysed; 15 samples were rejected due to improper packing; 39 samples of adulterated ammonium sulphate were analysed during the year and found to be highly adulterated.

In the analytical wing of the agronomy section the following table gives the work turned out regarding analysis of samples:—

|                                              |     |     |
|----------------------------------------------|-----|-----|
| Old balance at the beginning of the year ... | ... | 527 |
| Samples received during the year ...         | ... | 428 |
| Samples analysed during the year ...         | ... | 515 |
| Balance remaining at the end of the year ... | ... | 440 |

Bhavanisagar soil investigation research indicated that there was increase in the water holding capacity in soils grown with legumes without superphosphate. Farm yard manure, induced a higher water holding capacity than other soil amendments used.

The pilot scheme of agronomic experiments in black soil was started only during April 1960 and seven centres and two holdings were finally selected to take up the experiments.

In the study of the role of legumes in crop rotation of rainfed lands, at Koilpatti, no conclusions could be drawn so far as three cycles of rotations, were not completed.

In the rotation experiment at Agricultural Research Station, Bhavanisagar, the best rotation found so far was cholam, groundnut, Cotton and Sunnhemp in two years.

In the Soil amendment experiment at Agricultural Research Station, Bhavanisagar, the superiority of sunnhemp compost applied at the rate of 7,500 lb. per acre was established.

In the experiment to find out the best legume for Lower Bhavani Project area, Sunnhemp applied with phosphate was found to increase the yields of cotton and ragi. In the experiment to find out the effect of application of different green leaf manures on cotton and millets, all the green manures had the same effect on cotton and millets.

In the experiment to find out a suitable mixture of crops, cotton-groundnut mixture seems to be the best and also economic.

The experiments of co-ordinated trial of simple fertilizers on cultivators' fields and the model agronomic experiments, and were carried out as per approved technical programme and the results



COTTON FINENESS TESTS

were sent to the Indian Council of Agricultural Research, New Delhi for consolidation and interpretation. As regards the scheme of study of methods and practices of farming in Madras State, the enquiry was completed during the year. The results will be submitted to Indian Council of Agricultural Research, New Delhi for compilation and interpretation.

(b) *Whether the results of research have been transmitted to the ryots.*—Among the four experiments conducted by the teaching staff, the tillage-cum-manuring experiment in rice has given conclusive results that the optimum level of N for wet land rice was 60 lb. per acre and tillage had no effect on the yield. Superphosphate can be applied broadcast on the surface instead of as granules or pellets.

In the experiments at Bhavanisagar, four experiments came to a close. To obtain maximum return per acre, the best crop rotation for Lower Bhavani Project area was concluded as Chulam, Groundnut, Cotton and Sunnhemp. These are being transmitted to extension. The optimum dose of manure was fixed at 7,500 lb. of sunnhemp compost. The best mixture of crops was fixed as groundnut and cotton.

The above conclusions will be transmitted to the cultivators in due course through the extension section.

## 12. AGRICULTURAL ENGINEERING RESEARCH PROJECTS.

1. Initial trials with an oscillating type of spray irrigation unit (Kennell's oscillator) proved that unequal dispersion of the spray was caused even by normal wind velocities.

2. A small draft plough for single bullock power useful for work on the hill slopes was manufactured. Trial reports from Nanjanad are awaited on this.

3. Based on the principle of the fluid flow through a standard plug of cotton, a fineness testing device for cotton was designed and fabricated. Initial trials are encouraging. When completed with refinements, this may become a cheap and useful equipment for laboratory work.

4. Poultry trap nests with quadrant pieces to serve as closing doors were developed and supplied to the dairy for trials.

5. Six improved planting lifters for use in orchards were made and sent to the State farms for trials.

6. Useful equipments for soil conservation work were under different stages of development during the year. A cheap wooden level with refinements for reviewing at the eye level was designed. It is awaiting further trials at the field.

7. Considerable improvements in the shape of properly designed mallets were added to the original bark remover unit developed at the instance of the Director of Cinchona plantations at Anamalai. Increased output has been recorded with saving in time.

A double-acting power operated bark remover showed further promise of efficiency. This is under trials now.

8. The addition of support wheels and tyne points served to improve the original 'Kenya'—an earth scoop. Reversibility was introduced so as to utilise the same unit as a cultivator as well. The Assistant Agricultural Engineer (Soil Conservation) is making trials with this.

9. Two paddy transplanter units were acquired from Messrs. Krishni Sadhan Khendra, Surat. These are being experimented upon.

10. A small paddy sheller for ordinary domestic use was designed. This has two truncated cones, one rotating within the other. Small quantities of paddy, when passed between the interspace between the revolving cones, get shelled.

### 13. CROP IMPROVEMENT WORK (PADDY).

(A) Paddy.—(i) Improvement by pure line selections.—Pure line selection work was in progress in 26 local, popular varieties in the different Rice Research Stations, of the State.

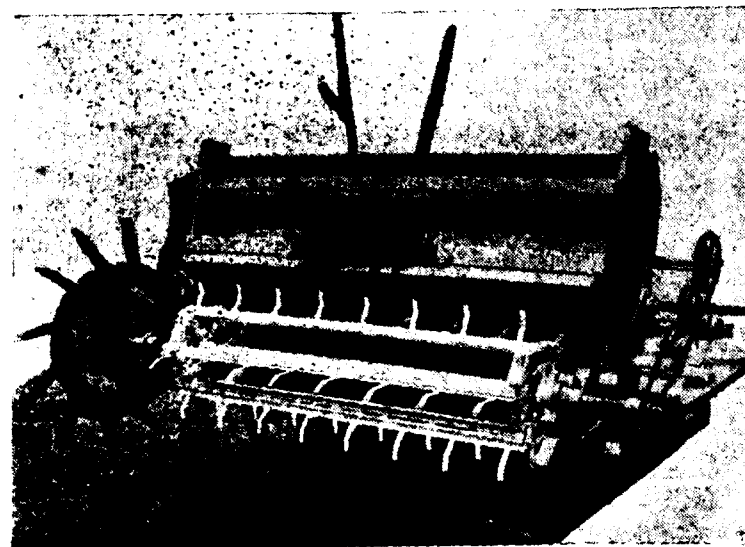
Sixteen selections from Tiruchengode Samba, a popular variety of Erode taluk, were under yield trial, with the ryots' bulk as standard, at the paddy Breeding Station, Coimbatore. At Aduthurai four cultures in Tiruthuraiipoondi Kar and 6 cultures in Mattaikuruvai were compared with their respective standards for yield and one culture No. 2172 in the former and two cultures Nos. 3025 and 3028 in the latter were found to be promising. One culture No. 2611 of kattuvanam, a flood resistant variety, gave the best yield among the three cultures tried for yield.

At Paramakudi, selections from Pulithipiratti, Kuliadichan, Banku and Varigarudan samba were grown and studied. The trials were largely a failure due to unfavourable rainfall. However seed materials were gathered from these to continue the work next year.

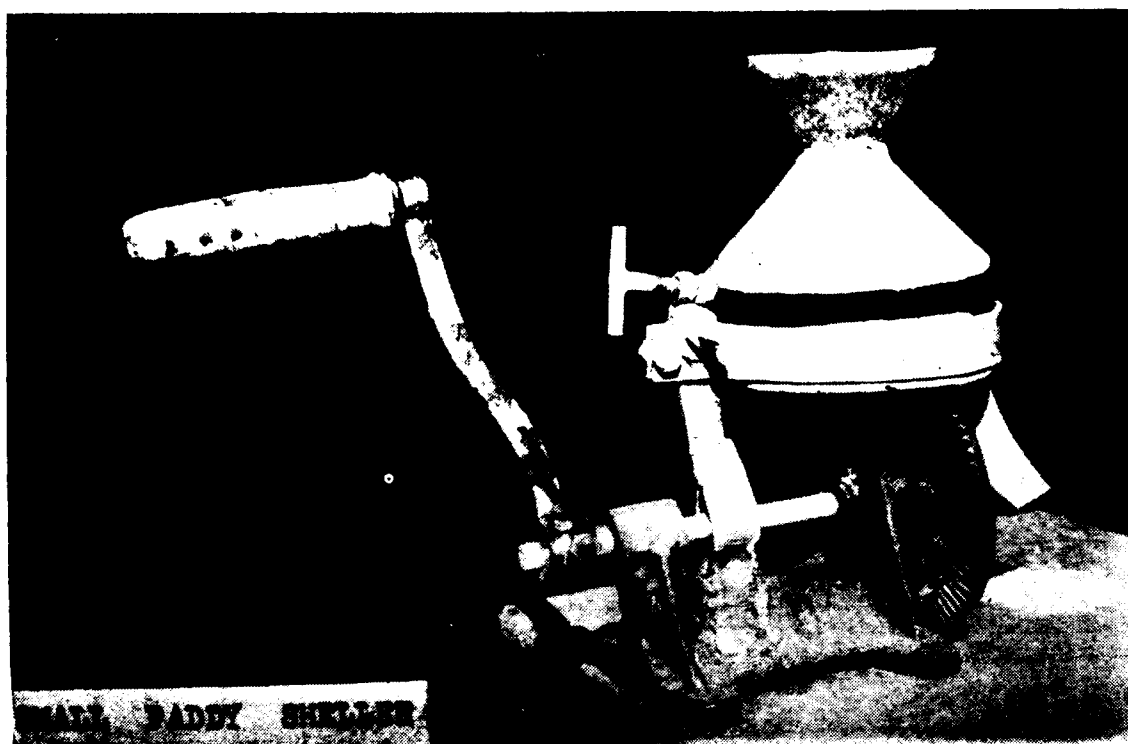
The five sornavari cultures under yield trial at Tirurkuppam, though did not give impressive yields on the farm, had two promising cultures among them, as reflected by their performance in the districts. In the samba season, Vadan samba, Chinna samba and Kappakar selections were under trial and the yield differences in the case of the latter two did not attain statistical significance, while two Vadan samba cultures gave better yield than ADT 22



CHINESE TRANSPLANTER  
(Manually Operated.)



CHINESE TRANSPLANTER  
(Bullock drawn.)



SMALL PADDY SHELLER

the standard. Although the cultures from Mottakar and Kesari gave better yield than their respective standards, the differences in yield were not statistically significant.

In the trial with Sornavari cultures at Palur PLR 2 gave the highest yield and was on par with two cultures 8888 and 1691. Culture 4124 of Thillainayagam was found to fair well and Typically saline conditions. The trials with Seevan samba and Thuyamalli samba were continued. Mottakar and Vellaikar cultures were compared against TKM 6. and PLR 2 in the Navarai season and one culture of the former and two of the latter were found to be promising.

At Pattukottai all the nine Mattai-Kuruvai selections appeared to be better than standard though the yield differences were not statistically significant. The trials with Kattaivellai, Kodaivellai and Kaivarisamba were repeated and two selections in each of the former two were sent out for district trials.

At Ambasamudram, two cultures, in Maikuruvai, and 4 cultures in seenganni gave increased yields over the standards in the kar season. Trials with Sembuli and Arikiravi were continued. The varieties from Madurai district in general and the Periyar tract in particular were maintained for further work and selection.

(ii) *Improvement by hybridisation.*—Special problems of the tracts were sought to be solved by the study of a large number of progenies obtained by making hybridisation between desirable parents and fixing up suitable high yielding lines.

(a) *Specific crosses for combining useful characters.*—The Kavunginpoothala natural cross progenies were studied with a view to spot out plants with profuse tillering habit and long showy earheads and as a result, nine promising cultures were fixed up which were multiplied and sent for district trial. The study of progenies of crosses between CH 2 and CO 13 and CH 2 and CO 10 resulted in the fixing up of three pure breeding cultures with stiff straw and dense panicle.

Twenty-four high yielding cultures were brought forward to the yield of trial stage, from progenies of cross between Bombay types, Kolamba and Zinnia, and GEB 24, made to combine the profuse tillering habit of GEB 24 and the branched panicle and fine grain quality of the types. With a view to improve the grain quality of CO 23, the progenies of the cross CO 23 x GEB 24 were studied which resulted in the isolation of three promising cultures for district trials. Four cultures with CO 19 type of grain and with improved panicle characters were marked out for yield trial from progenies of crosses between CO 19, and FLR 1 and ADT 17. The district trials with the 13 cultures, for the evolution of high yielding cosmopolitan strains, were continued.

Culture 4555 proved once again its superiority in yield over standard PLR. 1 in the trial of cultures studied for improvement of grain quality at Agricultural Research Station, Palur.

Cultures 5474 and 8769 of the cross GEB 24 x PTB 15 were sent for district trial to fix up a high yielding strain in the Pishanam season in Ambasamudram.

In an effort to get a high yielding but shorter duration strain than ADT 15 the progenies of ADT 15 x ASD 8 were studied at Pattukottai and the results revealed that none of the three selections tried was capable of giving better yield than ADT 15.

Study of ADT 16 x GEB 24 cross progenies produced four high yielding, shorter duration and non-shattering cultures which are undergoing yield tests on the farm at Aduthurai.

Two cultures of the season and period bound cross GEB 24 x CO 10 proved to be superior to TKM 3 in the districts and on the station at Tirurkuppam. The trials with CO 4 x Vadan Samba and ASD 5 x TKM 3 cultures were continued.

(b) *Evolution of short duration strains with seed dormancy.*—Progenies of crosses between popular non-dormant strains and a few exotic dormant varieties were under study both at Coimbatore and Aduthurai. The hybridisation work was undertaken to induce seed dormancy in the existing strains and to prevent loss in yield due to germination of grains on the earheads at the time of harvest and to ensure quality of seeds. The previous trials resulted in the isolation of 35 homozygous cultures for yield trials and 502 segregating progenies to make further selection and purification. A scheme financed by the Indian Council of Agricultural Research has been put into operation to continue the work with the available material at the two centres, viz., Coimbatore and Aduthurai. Fresh crosses between ASD 1 and ASD 3 and ASD 1 and Japanese types have been effected during the Navarai season of 1959-60.

(c) *Evolution of non-lodging strains.*—Lodging is an important character in deciding the final yield, as premature lodging causes half filled and ill-filled grains and consequently low yields. So crosses were effected between local strains and some of the reputed stiff straw types and their progenies were studied through successive generations. As a result, 59 homozygous lots were brought to the yield trial while three others were sent for trial in cultivators' holding. Besides, 286 single plants were also selected based upon their non-lodging habit. The studies were carried out at Coimbatore, Aduthurai and Pattukottai.

(d) *Evolution of high fertility strains—indica x Japonica crosses.*—In order to have strains which will respond to heavy manuring, crosses were effected between selected indica parents and Japonica types at the Central Rice Research Institute, Cuttack

and the F<sub>2</sub> Progenies of these crosses were distributed to the different States to pursue the studies. The progenies were critically studied under heavy manured condition, viz., 6,000 lb. green leaf, 225 lb. superphosphate and 200 lb. ammonium sulphate.

The previous years' trials brought to the forefront 47 promising cultures which were tested under comparative yield trials with their respective standards at Coimbatore. These cultures were derived from 23 sets of crosses and when the yield data obtained this year were statistically analysed, 39 of them were found to have promise. These will be tested in the coming years. The study of the Japonica x Indica progenies at Aduthurai resulted in the selection of 146 single plants and 9 homozygous cultures for further yield tests. At Tirurkuppam 159 single plants were studied under observation plots and 48 homozygous cultures, besides desirable single plants were carried forward for yield test and purification. Twenty-three short duration and 40 medium duration progenies of the Japonica x Indica crosses were studied in compact family block at Palur and the yield differences were significant. A total of 162 single plants from short duration crosses was selected during 1959-60 and they have just been sown at Ambasamudram.

(e) *Evolution of saline resistant strains.*—Two lakhs acres of saline and alkaline lands are available, scattered in different parts of the State and a strain capable of resisting salinity and alkalinity will go a long way in putting the land to better use and relieving the rice deficit to a considerable extent. Work was started in this line in 1947-48, by collecting and systematic testing of 76 Indian and exotic varieties known to possess this character. To this number, another 27 varieties were added during this year for intensive study at the Saline Rice Research Station at Peravurni, Thanjavur district. From a total of 438 single plants obtained from 14 sets of crosses between SR 26 B and Thellathokkavadlu, the resistant parents, on the one hand and a number of popular strains on the other, 52 homozygous lots and 1052 promising single plants were carried forward for further study. Besides these, study on the physiology of saline resistance by the estimation of osmotic concentration of cell sap, study of the anatomical features that are responsible for resistance to salinity and study of the effect of pre-treatment of seeds in different concentrations of salt solutions have been programmed for the station at Peravurni.

(iii) *Introduction of Exotic varieties.*—A total number of 2,410 types and varieties of both Indian and Exotic origin is being maintained pure and studied at the Paddy Breeding Station, Coimbatore for morphological as well as physiological characters.

Six short duration Chinese varieties were compared for yield against CO 13 standard and among them, three were found to yield better. These were multiplied and sent for district trials in

Coimbatore district, where they are doing well. These Chinese varieties could not outbeat any of the Aduthurai short duration strains in yield. From the results obtained at Palur and Tirukuppam it is seen that CH 62 has shown some promise.

Among eighty outstation strains tried for testing their suitability for growing in this State, a hybrid culture from Madhya Pradesh, Labhandi, was found to give better yield than GEB 24 and hence this was multiplied for district trial.

Six varieties received from Cuttack were tried at Aduthurai and 4 coarse varieties, CR 1, CR 2, CR 3 and CR 4 were found to be on par with ADT 9.

Besides these, interstrain trials with the strains released in the State were continued in all the Research Stations to fix up the most suitable strains for the different seasons.

(iv) (a) *Crop improvement by induction of mutations.*—Mutations were attempted to be created among the existing popular strains by treatment with chemicals like Benzene Vapour, Ceresan and acenaphthene and by x-rays, to select economic variants by observation and trial. On the whole, 12 mutants derived from CO 2, CO 13 and GEB 24 by these processes were under various stages of trials on the Station and in the ryots' holdings. The results from the district trials go to show that the mutants have got an economic value inasmuch as they yield better than the standards even though the yield differences did not attain the level of statistical significance. However the trials are being continued so that the most economic mutant can be fixed up for release as a new strain.

(b) *Estimation of natural cross pollination rice.*—An experiment to ascertain the extent of natural cross-pollination in rice was initiated at Coimbatore and Aduthurai in 1955-56 with suitable varieties. At Coimbatore CO 19 was used as the pollinating parent and CO 2 as the female parent. By studying the progenies of selected plants, the natural crossing was found to vary from 0.04 per cent to 0.5 per cent under Coimbatore conditions. At Aduthurai the results were more or less uniform and the percentage of natural crossing was found to be 0.04 for all the seasons.

(c) *Devising simple instruments to test the stiffness of straw in rice.*—The simple apparatus designed by Prof. M. A. Sharp was made use of in an experiment to test the stiffness of straw of six varieties grown under three different spacings and three levels of manuring. It was found, from an analysis of the results, that though lodging was a varietal character it could be controlled to some extent by adjusting the spacing and manurial doses since the increase in spacing caused a reduction in lodging while increase in the nitrogen favoured the tendency to lodge.

*Manurial experiments.*—(a) The experiment to determine the efficacies of different organic manures as against ammonium sulphate on equal nitrogen basis, either alone or in combination with phosphoric acid, potash and lime was conducted during Kuruvai and Thaladi seasons at Aduthurai and Samba season at Palur. The yield data revealed that farm yard manure had given the best yield in the Samba season at Palur and in the Kuruvai season at Aduthurai, followed by compost in the former place and green manure in the latter. In the Thaladi season at Aduthurai, application of green manure recorded the highest yield closely followed by ammonium sulphate. There was no large difference in yield due to the application of other nutrients though there was slight response in favour of phosphoric acid during the Thaladi season at Aduthurai.

(b) *Fractional application of ammonium sulphate.*—This experiment, designed to find out the advantages of split applications of the fertilizer and to fix the optimum time of application, was carried out in the research stations at Coimbatore, Aduthurai, Pattukkottai, Ambasamudram, Palur and Tirukuppam. While there was no appreciable and significant difference in yield due to the time of application of ammonium sulphate at Aduthurai, Palur and Pattukkottai, the trend in yield was in favour of split applications, one half at planting and the other a week prior to flowering, in Coimbatore and Tirukuppam. At Ambasamudram application in 3 doses, at planting, 30 days after planting and a week before flowering, was found to be effective.

(c) *Hyper phosphate experiment.*—The experiment to compare the merits of different phosphatic fertilisers, viz., hyper phosphate, Dicalcium phosphate and superphosphate, was laid out at the Rice Research Station, Tirukuppam, during the Samba season with 39 treatment combinations. The results did not establish the superiority of any one of the phosphatic fertiliser tried.

(d) To ascertain the truth in the recommendation that all the nitrogen should be applied at planting in the case of early maturing varieties, an experiment has been initiated at Ambasamudram with three treatments and two kinds of manure, ammonium sulphate and urea, and two varieties. The crop is on the ground.

(e) *Varietal response to manuring experiments.*—With the increased recognition of the use of artificial fertilisers to paddy the need is felt to have varieties which will respond to heavy manuring. This experiment conducted at Coimbatore, Aduthurai, Pattukkottai, Tirukuppam, Palur and Ambasamudram, envisaged the testing of popular strains of the region for any positive response to heavy manuring. Six varieties were selected for each station and the experiment was laid out in strip plot design, with five levels of nitrogen, viz., 0 lb., 30 lb., 45 lb. and 60 lb., in combination with 0 and 30 lb. K 20 over a basal dressing of 5,000 lb. green leaf



and 150 lb. superphosphate. Though the response to heavier doses of manures was not clearly brought out by the results obtained in the different stations, the fact that increased application of nitrogen increases the yield was proved.

*Cultural experiments.*—(a) Chinese methods of paddy cultivation received wide publicity in the press and it claimed that phenomenally increased yields could be obtained by adopting the method. To ascertain the usefulness of the method for recommending for wide-scale adoption by the farmers of the State, it was decided to compare its merits with the already popular Japanese method and the local farm method. The experiment was designed to have three treatments—(1) Chinese method, (2) Japanese method and (3) local method—advocated by the department and the variety used was Co. 25. The experiment was conducted during 1959-60 only in four selected centres, viz., Coimbatore, Aduthurai, Ambasamudram and Tirurkuppam.

The salient points contained in the Chinese method were soaking of the seeds in 4.8 per cent sodium bicarbonate solution for 48 hours before sowing, using a seed rate of 669 lb. per acre of nursery, digging the transplant field to a depth of 3' in layers of 6" and mixing heavy doses of manure with the soil and replacing the layers in order and applying 40 lb. K<sub>2</sub>O and 40 lb. P<sub>2</sub>O<sub>5</sub> and 100 lb. N to the crop. The main operation of digging the soil in layers was very time consuming and involved quite a lot of labour and expenditure. Detailed and critical observations at the various stages of the crop growth were recorded to fill up an exhaustive questionnaire. But in the ultimate analysis of the yield data, it was found that Chinese method had not yielded better than the other two methods tried in three out of four research stations. Only at Coimbatore it gave an increased yield of 8.5 per cent over the local method while the Japanese method was the next with 6.7 per cent increased yield. It will be quite evident that this method does not suit the conditions that exist in our State, because the cost of preparation of the land is exorbitant, which has resulted in a net loss, in all the stations ranging from Rs. 2,066 to Rs. 6,397 per acre.

(b) *Experiment on inter-cultivation with Rotary Weeder.*—To find out whether inter-cultivation by rotary weeder or hand rack as practised in the Japanese method a contributory factor in increasing the yields of crop, an experiment with ten treatment combinations, under normal and heavy manuring conditions, was laid out in Tirurkuppam in the Samba season. Although the treatment differences were not statistically significant, the trend of the yield data was in favour of all the treatments over the control.

(c) *Summer Ploughing Experiment.*—Ploughing the fields dry during the summer months of April-May as preparation for the kar crop near about Ambasamudram is being practised by the ryots.

When the previous results obtained are contrary to this practice, it was decided to test summer ploughing and broadcasting with farm method of preparation and transplanting. The results from two seasons showed that the farm method gave 17 per cent increased grain yield over the broadcast sowing.

(d) *Pre-soaking paddy seeds in sodium bicarbonate solution.*—Pre-soaking paddy seeds in soda-bicarbonate solution is being practised in China, it is stated, and in order to find out the usefulness of such a practice in increasing crop production an observational trial with paddy seeds treated in four different concentrations (2.8, 4.8, 6.8 and 8.8 per cent) of sodium-bicarbonate solution for 48 hours before sowing, was conducted at Coimbatore, Aduthurai and Palur. There was some increased yield when the seeds were pre-soaked in 4.8 per cent solution at Coimbatore and 2.8 per cent solution at Palur, as reflected by the results obtained during the year.

(e) *Miscellaneous experiments on optimum seed rate for broadcast crop at Tirurkuppam.*—To determine the optimum seed rate for broadcast crop of paddy and to find out whether the present seed rate of 60 lb. per acre could be reduced, an experiment was laid out in Samba season with 24 treatments and four replications. Though the yield difference did not satisfy the "F" test, the trend of the results showed that there was no appreciable difference in using either soaked seeds or unsoaked seeds and that broadcast crop gave definitely less yield than sowing behind the country plough.

*Schemes.*—(a) The scheme, partially financed by the Indian Council of Agricultural Research for the evolution of blast resistant varieties was in operation for the seventh year at Coimbatore and Aduthurai. Short and medium duration cultures were under study at Coimbatore while long duration cultures were studied at Aduthurai. The seasonal conditions, though favourable for the crop growth were not conducive for an attack of the pathogen and as a result many of the selections had to be done based on the apparent resistance and other desirable economic attributes of the plants studied. Twelve short and 18 medium duration cultures were under district trials besides a total of 388 segregating progenies under purification. In the long duration group, 83 cultures were compared for their yield and 481 single plant selections were made. Besides, the world collection of types were examined in batches for their resistance so that resistant ones may be used as parents in future hybridisation work. The monthly planting trials revealed that September to November plantings took severe infection of the disease, in the case of short-term cultures while very little infection was noticed in the medium and long duration groups.

(b) *Scheme for breeding drought resistant strains of paddy.*—The work in the scheme consisted of collecting varieties reported to be drought resistant and testing them for resistance to drought.

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testing of hybrid progenies for resistance to drought, and study of the root system and determination of the size and number of stomata in rice varieties. The scheme had Coimbatore and Tirur-kuppam as the venues. The studies resulted in the isolation of two promising cultures for district trial and 98 progenies for preliminary yield trials. The drought resistant types possessed well-developed root system and the root shoot ratio was also higher than in the susceptible varieties.

(c) *Scheme for evolving short-term rice varieties possessing seed dormancy.*—The scheme started functioning from 20th January 1960 at two centres, viz., Coimbatore and Aduthurai. The main items of study will consist of comparative yield trials with the promising hybrid cultures obtained from crosses between dormant exotic types and local strains and sifting and selection from segregating progenies now available for study, study of promising short-term rice types from the germ plasm bank maintained at the Paddy Breeding Station and some physiological aspects of seed dormancy.

(d) *Scheme for the evolution of strains for inundated areas.*—The scheme was in operation at Talainavar, Thanjavur district since 17th September 1959 under the partial financial assistance of the Indian Council of Agricultural Research. During the year, comparative yield trials were laid out with the cultures already available. Culture No. 2611 isolated from Kattuvanam, the reputed flood-resistant variety of Tiruthuraiipoondi taluk, was found to do well giving 6.8 per cent increased yield over the ryots bulk standard. The differences in yield were statistically significant. Four cultures of the cross PTB 15 × 10783 (Co. 3 × T. 272 Burma type) were also under yield trial on the station, against PTB 15 standard. The results of analysis were significant but among the cultures there was no large difference in yield. Cultures 3488/4 and 3488/1 gave increased grain yields of 10.2 per cent and 5.7 per cent over PTB 15 standard. These cultures attracted the attention of all ryots in the surrounding areas by their performance.

(e) *Scheme for the evolution of saline resistant strains.*—A new Research Station at Peravurni in Pattukkottai taluk of Thanjavur district where typical saline and alkaline conditions exist has been opened where the work on saline resistance hitherto carried on at Coimbatore will be pursued in a comprehensive manner. The study consists of selection of suitable saline resistant varieties under cultivation in different parts of India, selection from the hybrid progenies available at present and ascertaining the physiological and anatomical characters of saline resistance.

*Other crops.*—Production and distribution of green manure seeds and seedlings, vegetable seeds and seedlings and fruit plants received adequate attention at all Research Stations. Other crops like cotton, groundnut, gingelly, ragi and pulses were also raised during the fallow period.

*Seed distribution.*—A total quantity of 249,395 lb. of nucleus paddy seed was produced for supply to the State Seed Farms and the Extension Officers from the seven Rice Research Stations during the period.

*A short summary of the salient features of work done during the period ending 30th June 1960.*—The seven rice research stations carried on the crop improvement work as per the approved programme of research. Besides the breeding work, several manurial and cultural trials were also in progress.

*Pure line selection.*—A total of 370 cultures from 26 local unselected bulk varieties was under trial to select high yielding pure lines. Some of the most promising selections were tested in the ryots' holdings in the different districts and the trials were continued during this year also. A few promising varieties to suit the different conditions existing in the various parts of the State, like semi-dry areas, inundated areas, alkaline and saline areas, etc., have been isolated.

*Hybridisation.*—This technique of crop breeding was used to evolve high-yielding strains for a number of special problems like blast resistance, drought resistance, saline resistance, including seed dormancy in short term varieties, evolving strains possessing stiff straw, quality rice, non-shattering habit and that will respond to heavy manuring. Two blast resistant cultures, 6522, Co. 13, Co. 4 and 6538 (GEB 24 × Co. 4) of short and medium duration respectively, have been fixed up for the release as strains. Useful information had been gathered on the performance of the promising cultures studied for the different purposes, both on the research stations and in the districts.

*Induction of mutations.*—Seeds of popular strains were treated with chemicals like acenaphthene. Benzene vapour and ceresan and X-ray to induce economic mutations in them. Twelve such promising mutants, underwent the district trials this year.

*Introduction.*—A large number of varieties from outside the State as well as from outside the country was tried and one variety from Malhva Pradesh, Labbandi, and three Chinese varieties were found to perform well under the conditions obtaining in the State. Besides, 2516 types from the world collection of varieties were maintained genetically pure.

*Manurial and cultural experiments.*—The results of manurial and cultural experiments conducted during the period under report are summarised below :—

1. Farm yard manure had given the highest yield at Aduthurai during Kuruvai season while green manure was the best in the Thaladi season.

2. There was no large difference in yield when ammonium sulphate was applied in a single dose and in split doses at Aduthurai, Palur and Pattukkotti while split doses had a beneficial effect at Coimbatore and Tirurkuppam.

3. There was no differential effect on rice yield due to the different phosphatic fertilisers.

4. Increased doses of nitrogen, enhanced the yield of varieties and there was no particular response between the varieties for increased application of manures.

5. Chinese method of rice cultivation was not found to be suitable for wide adoption because it could not give better yield than Japanese method and local farm method and also the net loss in pursuing the technique was alarmingly enormous.

6. Intercultivation either with rotary weeder or hand rake did not increase the yield appreciably.

7. Summer ploughing was not better than farm method adopted at Ambasamudram.

8. Pre-soaking paddy seeds in sodium bicarbonate solution slightly increases the yield of rice.

9. Broadcasting gave less yield than crop sown behind the country plough.

Progress of Research and how far the results of Research have been transmitted to the ryots and the economic gain to the ryots.

The most urgent problems affecting rice production are the incidence of diseases like blast and pests like stem borer, bug, etc., large area under saline and alkaline conditions, flooded condition and low rain fall tracts, lodging and seed dormancy, etc. These aspects are being tackled intensively in the various schemes, with the financial assistance of the Indian Council of Agricultural Research. Besides these, a few other problems also remain to be considered and solved by the improvement of rice varieties grown under high altitude areas; lift irrigation areas, project areas and some other specialised pockets. While the research work in progress on the former set of problems has given very encouraging results, work on the latter is expected to be taken up in the coming years.

The Department has so far released 72 improved strains from the five Research Stations. Quite a few of these strains have now been withdrawn being of limited distribution. Twenty-five of them have been found to be more suitable than others and are very largely grown. Among these, some strains have a cosmopolitan nature and these strains are capable of giving good yields under varying conditions of soil and climate. Considering their plasticity, they have been assigned state numbers. The recent pilot survey

conducted in 1958 on different crops in our State has assessed the percentage of coverage by improved strains of paddy as 65 and the results indicated that it requires a more concerted efforts by all concerned in the Department to increase the area under improved strains. It is gratifying to note that this item of work is making rapid progress with the opening of Community Development and National Extension blocks where the staff are in a position to carry the results of research to the very doors of the cultivator.

The benefits accrued by adopting the improved practices of rice cultivation, use of good pedigree seeds, judicious manuring of the crop with organic and inorganic manures, timely plant protection measures, etc., have largely reflected in the increased production of rice for the State, from about 2.75 million tons of rice in 1955 to 3.30 million tons in 1959. There has been a steady increase in the yield per acre also. The programmes of research have no doubt been keeping pace with the requirements of the ryots and the release and distribution of seeds of improved strains and more than anything else, the recognition of the quality and use of these strains by a large section of the cultivators have played no mean part in the advancement of agriculture in general and increased production in particular. The use of improved strains by all most all the States and district prize winners proved beyond a shadow of doubt that the improved strains were primarily, if not entirely responsible for their obtaining phenomenally high yields.

#### B. Millets.

*Cholam (Sorghum species).*—Cholam is grown over an area of nearly 18 lakhs acres in the Madras State with an annual production of 5 lakhs tons of foodgrain. Its straw is valuable and more than 80 per cent of the area is cropped with rainfed varieties. The important varieties grown in the State in the monsoon season are Periamanjai Cholam, Talaivirichan cholam, Makkattai Cholam and Irungu Cholam. The crop is grown under irrigation in the summer season and the varieties grown have a shorter duration. As a result of work done at the Millets Breeding Station, Coimbatore a total number of 19 strains were released for general cultivation. Work for the further improvement of the crop was continued at the Millets Breeding Station, Coimbatore. The crop was grown in an area 18.18 acres in the summer season under irrigation and in 5.47 acres in the monsoon season under rainfed conditions. A total number of 725 selections were sown and studied. A brief account of the work done and the results achieved during the year are presented in the following paragraphs:—

(a) *Periamanjai Cholam.*—Periamanjai Cholam is the most popular dryland variety mainly grown in Coimbatore taluk. Co. 1 is the standard strain of the variety and it has pithy stalks which are blackish purple in colour. Work was continued to evolve a

high-yielding strain with juicy stalks and reddish purple pigmentation. Two derivatives of the crosses having these desirable attributes were compared in comparative yield trial in 1959 monsoon season against strain Co. 1 as the standard. The differences in yield of both grain and straw were significant and selection A.S. 9079 recorded 17.4 per cent higher yield of grain over strain Co. 1. In the yield of straw however it was inferior to strain Co. 1 with a view to tone up the fodder quality of strain Co. 1, crosses were effected between the fodder cholam strain Co. 11 and Co. 1 and from the progenies studied, six selections having sweet and juicy stalks with reddish purple colour were advanced to preliminary yield trials. The wild Johnson grass (40 chromosomes) was successfully crossed with strain Co. 1 (20 chromosomes), and economic plants with heavy tillering habit and drought resistance combined with the agronomic qualities of strain Co. 1 were fixed.

(b) *Talaivirichan Cholam*.—In this variety, five improved strains have been released and they are under spread in North Arcot, South Arcot, Salem and Tiruchirappalli districts. Of the five strains released, Co. 19 was found to be plastic suiting the abovementioned tracts. Ten economic selections evolved by pure line selection and hybridisation were under test against strain Co. 19 in comparative yield trials. Two bold grained selections with juicy stalks registered 14.5 per cent higher yield of grain but the differences were not significant.

(c) *Irungu Cholam*.—Irungu Cholam is a fodder variety commonly grown in the southern districts of the Madras State. Two improved strains K. and K.3 are under spread in the tract. Work on the improvement of fodder quality of strain K. 3 was continued during the year and one juicy stalked selection A. S. 8810 was compared with K. 3. The yield differences did not reach the level of significance. From the crosses effected for toning up the yield of the strain, 13 selections were taken for further work.

(d) *Strige resisting studies*.—Strige is a root parasite on cholam causing heavy losses in yield of strain and straw. The Periamanjai Cholam strain Co. 1 which is highly susceptible to this parasite was crossed with A.S. 4003 (Bonganhilo, an African type resistant to the parasite). Among the derivatives of the crosses tested selection A.S. 9028 was found to be promising and in the comparative yield trial held at the station, it was found to be on par with strain Co. 1 in grain yield.

(e) *Sen Cholam*.—This is a red grained variety cultivated extensively under irrigation in Salem, Tiruchirappalli parts of Madurai, and Coimbatore districts. Cholam Co. 4 is the standard strain of this variety. With the object of evolving a bold grained and juicy stalked strain of Sen Cholam, the bold grained selection A.S. 7589 was crossed with a juice stalked Sen Cholam mutant.

From the derivatives studied four selections were found to be promising and these were crossed again with the strain Co. 13 to tone up the grain yield. Three hybrids were raised for further study.

(f) *Chinnamanjal Cholam*.—Chinnamanjal Cholam is grown under irrigation in the summer season in Coimbatore district. The improved strain of the variety Co. 5 has juicy stalks. Crosses were therefore, effected for improving its fodder quality by inducing juiciness. Among the progenies studied, on selection A.S. 9361 was found to be the best. It was compared with strain Co. 5 in 1959 summer season. The yield differences were not significant.

(g) *Vellai Cholam*.—Ten Vellai Cholam strains with duration ranging from 85 to 120 days and one grain-cum-fodder strain maturing in 95 days were released from the Millets Breeding Station and they are under spread. Of these strains, Co. 18 proved to be the most popular and was particularly appreciated by the farmers for its high yield and superior fodder quality. The pink wash on the grains was however, considered to be a disadvantage in the southern districts and hence work on the elimination of this defect was taken up. Crosses were effected between Co. 18 and Co. 12 and from the progenies sown and studied, eight selections were advanced to yield trial in 1959 summer season. Two selections with juicy stalks and pearly white grains were found to be on par with strain Co. 18 in grain yield.

(h) *Fodder Cholam*.—With a view to evolve a fodder cholam strain which can be cut for fodder in less than 45 days, crosses were effected between the fodder Cholam strain Co. 11 and Sundhia Jowar, an early fodder type from Bombay. The F. 1s were raised and sufficient seeds collected for further studies. The quality of the fodder cholam strain Co. 11 was further improved by hybridisation with Leoti, a sweet Sorghum type received from the United States of America. From the F. 2 population raised during the year, 25 single plant selections were carried forward for further study.

*Fundamental Research*.—(i) Studies on the genetics and anatomical structure of Sorghum glume and awn were continued. Crosses were effected to pursue the inheritance of glume shape (ovate and obovate, texture-coriaceous, crustaceous and papery, wrinkling wrinkled and non-wrinkled and gaping-gaping and non-gaping). The progenies of the crosses were raised in F. 4 generation and necessary seed materials taken for further work.

(ii) *Hybrid Sorghums*.—The work on the exploitation of heterosis for stepping up production in Sorghum was initiated during the year under report. The cytoplasmic sterile lines, their fertile counterparts and the restorers were obtained from the United States of America and crosses were effected between the male sterile lines and the improved strains of the state and all of them proved to be restorers.

**Cumbu** (*Pennisetum typhoides* S and H).—The work on the evolution of hybrids in Cumbu which was in progress for nine years under a scheme partly financed by the Indian Council of Agricultural Research came to a close during March 1959. Seed materials that became available were taken over by the main section and the work is being continued at the Millets and pulses Breeding Station, Coimbatore.

During the period under report, two crops of cumbu were raised and studied—one under rainfed conditions and the other under irrigation. The yield of the crop raised during the summer season was normal while the rainfed crops recorded poor yields as severe drought prevailed during the growth period of the crop. Three hundred and forty medium duration inbreds and 136 short duration inbreds were raised and studied in detail. This were selfed and seed materials in each were taken for further studies.

During the Summer season, eight short duration hybrids were tested in an yield trial along with strain Co. 3 and hybrid N3 for comparison. None of the hybrids gave higher yields than X.3. In the monsoon season five short duration hybrids were put under yield trial with X.3 and Cumbu Co. 3 as controls. Though hybrid 1169 recorded 24 per cent more yield than the strain Co. 3, the differences were not significant statistically. In the medium duration group, five hybrids were tested in a comparative yield trial with X.1 and Co. 1 as standards, but the yield differences were not significant. A total number of 22 short duration and 147 medium duration top crosses were tested in replicated row yield trial along with their inbred parents and testers. Out of these two top crosses in the short duration group and 46 in the medium duration group were found to be significantly superior to strain Co. 3 or Co. 2 respectively.

Fifteen short duration inbreds selected for composting into a synthetic, were grouped into three sets with five parents in each. Seeds of synthetics were produced by two methods, viz., (a) by mixing and sowing the seeds of the five parents in equal proportions and (b) mixing and sowing the seeds of crosses between the five parents in all possible combinations and harvesting the resultant produce. The 15 inbreds were also grown in poly-cross nurseries separately and sufficient seeds in each were collected.

In the trial with the single crosses in all combinations between the five parents of each set, their top-crosses, the inbred parents, their poly-crosses, and the synthetics, the poly-cross lines of five inbreds recorded significantly higher yield than the single crosses, top-crosses and inbred parents. The five inbreds will be utilised for producing higher yielding synthetics. A total quantity of 5,200 lb. seeds of improved strains of Cumbu were distributed during the period under report.

Work under the scheme for the rapid multiplication and distribution of Hybrid Cumbu seeds sanctioned in G.O. Ms. No. 2199 of Food and Agriculture, dated 25th June 1953, is in progress at Sathyamangalam from 23rd November 1953. The work of multiplication of seeds was carried out during the period at four centres, viz., Agricultural Research Station, Bhavansagar, State Seed Farm, Sathyamangalam, State Seed Farm, Kannampalayam, and State Seed Farm, Veerakeralam. Apart from this, primary seed farms in 13 centres were utilised for the production of X. 3 hybrid seeds. A total quantity of 24,644 lb. of seeds of cumbu hybrids X.1, X.2 and X.3 were produced and distributed to the cultivators during the year ending 30th June 1960.

**Ragi**—*Ragi* (*Eleusine coracana*) (Gaertn).—In the Madras State, Ragi is grown over an area of 10 lakhs acres with an annual production of 5 lakhs tons grains. The higher production is due to the cultivation of the crop in large areas under irrigated conditions. The demand for the improved strains continued to be heavy during the year and a total quantity of 16,285 lb. of nucleus seeds was distributed through the District Officers. In district trials the strain K.2 has fared well in Madurai district. In Chingleput district Co. 7 Ragi has given an average increased yield of 43.17 per cent over the local. At the Millets and Pulses Breeding Station, Coimbatore an area of 2.06 acres was sown with Ragi for experimental studies.

(a) *Evolution of short duration strains of Ragi (90 days).*—Two promising short duration selections, viz., E.C. 4713 and E.C. 4728 were tested in comparative yield trial against strains Co. 7 and AKP.2 as standards. The results revealed that Co. 7 and E.C.4728 were significantly superior to the standards strain AKP.2 recording 52.0 and 37.4 per cent increased yield of grain. As selection E.C. 4729 has proved consistently superior to strain AKP.2 in all the four years of trial held at this station it is ready for trials in the cultivators' holdings in the districts.

From the crosses between Co. 7 and A-KP. 2 four crossed heads were collected and preserved to raise progenies for further studies. Among the eight progenies of the crosses between the strains Co. 6 and Co. 7 only one hybrid was obtained.

(b) *Evolution of short duration, high yielding and non-lodging strains of ragi by hybridisation.*—Ragi strain K. 2 possesses non-lodging habit couple with resistance to the 'Blast' (puricularia) disease. But this strain has a long duration of 135 days. The latest strain Co. 7 is of 100 days duration and it responds well to latest strain Co. 7 is of 100 days duration and it responds well to heavy manuring. It has a tendency to lodge and is susceptible to 'Blast' disease. Hence crosses were effected between K. 2

and Co. 7 for evolving a high yielding and non-lodging strain which will mature in 100 days. Five crossed heads were collected. The F. 1 population was raised and seed materials have been gathered for further studies.

(c) *Evolution of high yielding white grained ragi strains with short duration*.—Ragi strain Co. 6 has white grains which are rich in vitamin B.1 and protein, but it is a poor yielder. It has also a long duration of 120 days. To tone up its yield and to reduce the duration still further, strain Co. 6 was crossed with the short duration strain Co. 7 (100 days). From the five crosses made, single plant selections have been isolated for further work.

(d) *Fundamental studies on the tillering habit in ragi*.—Tillering habit is an economic character in ragi. Observations made with the types and collections grown at the Millets Breeding Station, Coimbatore, showed that there is a wide range of variation in the tillering habit of this crop. Studies of this character were continued and out of a total number of 30 types grown and studied six types exhibiting heavy tillering and 23 types of medium tillering were noticed. The rest are poor tillering.

*Tenai and Minor Millets*.—Tenai and minor millets which include varagu, samai panivaragu and kudiraivali are cultivated in about 12 lakhs acres in Madras State. As a result of selection, three high yielding strains in tenai, two in varagu and one in each of samai and panivaragu have been released for cultivation. In tenai, an economic short duration selection S.I. 4894 of 85 days duration has been isolated from a cross between the standard strain Co. 1 and a short duration selection of Salem district. Subsequent work in this line of research has resulted in the isolation of two more short duration higher yielding selections. With a view to evolve heavy tillering, high yielding and short duration selection suitable for growing under irrigated and rainfed conditions, crosses were effected between the strains Co. 2 and Co. 3 and from the progenies tested, two promising selections with short duration were advanced and sown in comparative yield trials. The best of these two selections along with two other selections were compared in an yield trial during the period under report to isolate the best among them. Two selections have recorded the same yield as S.I. 4894 with about 29 per cent increase over the strain Co. 2. Selections resistant to the rust disease among the Japanese varieties were studied further for their resistance. A total of 31 economic selections with resistance to the rust diseases have been carried forward for further studies. A total of ten crosses were effected by the contact method. Plants which appeared to be hybrids have been selected for further confirmation and study. In samai, kudiraivali and panivaragu the types and selections on hand were sown for renewal and maintenance.

## PULSES.

*Pulses*.—Pulses occupy an area of 12 lakhs acres in Madras State, the major crops among them being redgram, horsegram, blackgram and greengram. Pulses are grown in drylands mostly as mixtures with millets and oilseeds. As a result of research work done in these crops, one improved strain in each of redgram, greengram, horsegram and bengalgram has been released. During the year under report, a total quantity of 3,800 lb. seeds of improved strains was distributed among the farmers in the districts.

(a) *Redgram (Cajanus indicus)*.—A total of 185 types including 26 cultures resistant to 'Wilt' disease and 20 perennial types were sown and studied and requisite seed materials were collected for further work. To evolve a high yielding and short duration redgram strain for late season sowings, three early maturing selections evolved by pure line selection were tried in a yield trial with Tenkasi bulk as standard. Two of these No. 2603/2 and No. 1922 recorded higher yields than the local, but the differences were not significant.

(b) *Greengram (Phaseolus aureus)*.—Six samples of greengram obtained from outside the State, ten from Madras State and 16 advanced from the progenies of crosses between Greengram and blackgram were studied in observation plots. Five economic selections were compared with strain Co. 1 in an yield trial under rainfed conditions. Due to adverse seasonal conditions, the trial failed. Available seed materials in each selection were collected and preserved for further work.

(c) *Blackgram (Phaseolus mungo)*.—Six samples of greengram collected from Madras State as well as from outside were sown in observation plots. Nine economic cultures evolved by pure line selection were tested against the Standard type No. 212 in an yield trial under protective irrigation. Due to excessive rain received during the flowering phase of the crop, the pod setting was very poor and hence no conclusive results were obtained.

(d) *Horsegram (Dolichos biflorus)*.—Twenty types of horsegram were studied in observation plots and carried forward for maintenance. Improved strain Co. 1 was found to be plastic suiting the entire state. From the work done in the previous years, three early maturing selections of Horsegram were isolated and compared with strain Co. 1 in a Preliminary yield trial. The results were not significant.

(e) *Lablab (Delichos lablab)*.—The scheme for the improvement of Dolichos Lablab, partly financed by the Indian Council of Agricultural Research, was implemented on the 15th July 1959.

Sixty field lablab types and six Kitchen garden types were grown and studied in detail. To this, a total of 143 collections of field types and 56 Kitchen garden types were added.

Six promising selections of field lablab types were tested in an field trial with D.L. 231 as standard. Two selections, D.L. 2465 and D.L. 2542 were found significantly superior to the rest recording 56.7 to 78.1 per cent higher yield than the standard.

Seven sets of fresh crosses between field bean types and garden bean types were effected and seeds have been collected for further study.

From the F. 2. progenies of nine sets of crosses which were studied, seeds from 280 single plants were taken for further work.

Among the field lablab types studied, D.L. 2542 a selection from Tenkasi tract, has proved its suitability as a green manure crop, recording an yield of 29,000 lb. of green matter per acre in about 60 days after sowing.

(f) *Cowpea (Vigna sinensis)*—(i) *Grain types*.—Sixty-nine types of Cowpea were studied in observation plots. Eight high yielding selections of dryland, Cowpea, were tried in an yield trial with C.57 as standard. The trial failed due to severe drought that prevailed during the growth period.

(ii) *Vegetable types*.—Seeds of long podded type, E.C. 455, was multiplied for distribution and there was good demand for its seeds. Selection C.521 was found promising as a green manure crop among the types grown and studied during the year. To popularise the same and to fix the seed rate for obtaining maximum yield of green matter, a preliminary trial with different seed rates was initiated. There was a steady increase in yield of green matter up to a seed rate of 70 lb. per acre, but yields at 50 lb. and 60 lb. per acre were found to be on par with obtained by adoption of 70 lb. acre. A maximum yield of 26,700 lb. of green matter was obtained by adopting a seed rate of 70 lb. per acre.

(g) *Clusterbeans (Cyaiuopsis psoraloids)*.—Twenty-two types of clusterbeans were grown and studied in observation plots. In a preliminary trial conducted to fix the best type for green manure purposes and the optimum seed rate, it was found that C.P. 380 is the best one for green manure as well as for yield of green pods and the optimum seed rate was found to be 40 to 50 lb. per acre. The popular short podded selection C.P. 78 and the long podded selection C.P. 380 were multiplied and a total quantity of 45 lb. seed was obtained. When raised for seed purposes, C.P. 78 recorded 600 lb. of seed per acre.

*Results of practical value*.—(i) The superiority of A.S. 9028 over improved strain Co.1 in yield and resistance to striga has been confirmed. The selection has completed trials in the districts and is now ready for release as an improved strain of Periamanial Cholam. It can spread in about 60,000 acres yielding an additional production of 1,500 tons of food grains valued at five lakhs rupees. The strain will also be suitable to areas where striga infestation is heavy.

(ii) Hybrid seeds of Cumbu were multiplied on a large scale under a special scheme sanctioned by the State Government and a total quantity of 24,644 lb. seeds was distributed during the year. This would have covered an area of 3,000 acres resulting in an additional production of 300 tons of grains valued at one lakh rupees.

(iii) Five high yielding inbreds which combine very well as revealed by the polycross performance were fixed for the production of high yielding synthetics. Synthetics have an advantage over single hybrids in that the seeds obtained from the former can be used by the farmers for three or four seasons and there is no need for the farmers to depend on supply of hybrid seeds from Government farms every year.

(iv) A high yielding early selection of Ragi has been isolated and its superiority over the standard strains AKP.1 and AKP.2 has been confirmed in trials at the station. This new selection is now ready for trial in cultivators' holdings.

(v) By hybridising the improved strains of Tenai Co.2 and Co.3 a new selection combining the highly tillering habit of strains Co.3 and the high yield of strains Co.2 has been evolved. In addition to the high yield, the selection has been found to be suitable for cropping under irrigated and rainfed conditions.

(vi) Cowpea C.521 was found to be ideally suited as a green manure crop recording 26,700 lb. of green matter per acre at 60 days growth.

*Whether the results have been transmitted to ryots*.—Necessary steps have been taken for the distribution of millet seeds of improved strains on a large scale. Sufficient publicity through the medium of Journals, newspapers, Radio Talks, Farmers' Day Celebrations, Agricultural Exhibitions and Village Leaders Camps was given and the practical significance of the achievements of research work done in millets and pulses was explained. There has been a considerable improvement in the quantity of seed distributed and a total quantity of 1,82,751 lb. of nucleus seed was supplied from the stations. These would have covered an area of 27,507 acres.



*Economic gain to the ryots by the adoption of results.*—Among the improved strains released, Co.1, Co.19, K.3, Co.11 and C.18 in Cholan; K.3 in Cumbu; Co.7 in Ragin; SA.1 in Redgram and Co.1 in Horsegram continued to be very popular. The strains have spread over an area of 33 lakhs acres which is about 46 per cent of the total area under millets and pulses. The resultant additional production of grains due to the spread of the strains may be estimated at 1.98 lakhs tons valued at 5.90 crores of rupees.

### C. Oil Seeds.

The following schemes financed by the Commodity Committees and State Government were in progress during the year. A brief outline of work done in each scheme is furnished below :—

1. *Scheme for research on the physiology of groundnut.*—The original sanctioned period of the scheme came to a close on 17th February 1960, but the extension of scheme for a further period of three years was sanctioned by the Indian Central Oil-seeds Committee and the Government order sanctioning the extension is awaited. Studies on physiological aspects of groundnut were in progress during the period. The effect of different ratios of K:Ca:Mg (3:4:3, 6:4:3 and 9:4:3) were studied on the growth and yield of groundnut (bunch variety). In general the growth was somewhat better in treatments where the split dose of salts were applied after the cessation of flowering. Estimation of B Indole Acetic acid in the aqueous extract of seeds of the bunch groundnut was attempted. An observational trial on inducing dormancy in the bunch groundnut is in progress. Studies on shortening the duration of the bunch groundnut with the growth regulating chemical 'TIBA' were conducted at the Agricultural Research Station, Tindivanam. Individual effects of trace elements like Cu, Mn, Zn and Boron were studied on the field grown bunch groundnut plants. Boron appears to improve germination and flower production.

2. *Scheme for research on the cytology of groundnut.*—This scheme sanctioned for a period of five years came to a close during the period. The Scheme had to be terminated as per Government orders during the period. However the Government have accepted the proposal to merge this with the Scheme for intensive breeding of groundnut and final orders are awaited. Work on Cytological aspects of groundnut was in progress. Three diploid (2n=20) and five tetraploid (2n=40) related species of groundnut were both seed grown and vegetatively propagated at three centres of Madras State. In the semi-spreading types of groundnut the occurrence of red testa colour was recorded. In the three types, one from China and two from Sudan (A.H. 7328, 7242 and 7287 respectively) and purple testa in a variety from Tanganika (A. H. 7215). The triploid hybrid (2n=30) between A. Hypogaea (2n=40) × A.

Villosa (2n=20) was back-crossed as the male parent to the bunch groundnut. One plant out of the progeny combined the spreading and a few other leaf and flower characters of the Villosa with the other characters of the cultivated groundnut. The plant was 40 chromosomes and is a fertile synthetic tetraploid groundnut. The meiosis of the Plant revealed association of one quadrivalent and eighteen bivalents like other cultivated groundnuts. An analysis of the meiotic behaviour of the triploid and of the tetraploid back cross plant indicates that of the two genomes that constitute the male parent one was the full B genome and the other ten chromosomes at random mostly from the 'A' genome and probably one or two from the 'A' genome.

3. *Scheme for the intensive breeding of groundnut.*—This scheme is functioning at the Agricultural Research Station, Tindivanam. The Government have ordered the merging of this scheme with that of the scheme for research on cytology of groundnut and final orders are awaited for implementing the merged scheme.

Four hundred and seventy new varieties representing collections from India and geographical races were studied and 103 single plant selections were made. Sixty-three promising selections from pure lines were multiplied for conducting yield trials during 1960-61. In addition 467 selections were also under initial yield trials and 117 of these superior to their standards were advanced to further stages of trials. Under the hybridization programme for the four set purposes of the scheme, 17 dormant bunch selections, 13 white seeded selections, 32 Big seeded and 22 others with good shelling outturn were advanced to rigid yield trials. As many as 1,447 selections from F2 and F3 progenies of crosses and back crosses were in different stages of study and initial yield trials.

4. *Scheme for the improvement of Pollachi red groundnut.*—This is a scheme sanctioned for a period of five years and is due to terminate on 31st March 1961. The Research Station for carrying out the work contemplated under the scheme is located at Pollachi.

Collection of Arachis varieties numbering 206 was raised and studied. Three bunch purelines, viz., A.H. 4218, A.H. 6179 and A.H. 6279 were under scattered block trials in ryots' holdings for the second year in succession and A.H. 4218 was found to be promising. Two sets of seven and four mass selections from 'Pollachi red' groundnut were under comparative trial for the third and first year respectively. Four red seeded bunch selections were tried under comparative yield trials for the first year. Other selections were under various stages of trial.

5. *Scheme for the intensive breeding of sesamum.*—This scheme was sanctioned for a period of five years and was put into operation on 9th June 1959. The object of the scheme is to evolve



short duration and long duration gingelly strains suited for rain-fed cropping in the Central and southern districts of Madras State respectively.

Three strains, one from Kanpur, Uttar Pradesh and two from Berhampore, West Bengal were compared with Local sesamum. Strains Berhampore-2 (Til. No. 14) was found significantly superior to the others and it recorded 40.4 per cent increased yield over the local variety. All the three strains (TMV.1,2,3) were shorter in duration than the local by about 20-25 days; however the local varieties were found superior in yield to the strains.

Ten crosses and ten reciprocal crosses, were made between the local and selected parents possessing economic characters like branching, high yield, close-set capsules 1-3 capsules per leaf axil, etc. Six hundred and fifty single plant selections and one mass selection were made during the period from a survey of local crop.

6. *Comprehensive coconut nursery scheme.*—This scheme entered the fourth year of operation at Pattukkottai and third year in the other centres. A total of 13,046 parent palms were selected for procuring seednuts and 1,60,340 seednuts were procured from these parent palms for planting in 1959 nursery. Out of 1,60,340 seednuts procured 1,59,974 nuts have been planted in different nursery centres. A total of 99,421 quality coconut seedlings were distributed during the period under report.

7. *Scheme for establishment of a regional coconut research station in Tanjore district.*—This is a scheme sanctioned for five years and was put into operation on 28th March 1958 at Veppankulam in Thanjavur district.

Twenty-five mother palms were selected at three different centres and 302 seed coconuts were procured from them to raise seedlings for the layout of progeny studies at the Station. A total of 423 seed coconuts procured from selected mother palms at Maravakadu centre were sown in the nursery and germination percentage of 91.5 per cent was recorded. Seedlings of 18 exotic and local varieties and TXD hybrid were planted for the purpose of comparative study.

8. *Scheme for the establishment of four demonstration coconut plantation in the Kazhuveli swamp area in Tindivanam taluk.*—Two demonstration farms have been started to Kaliperumpakkam and Nadukkuppam in the Kazhuveli swamp area. At the Kaliperumpakkam the farm was divided into convenient blocks. Seedlings numbering 253 were planted adopting three methods of planting, viz., mound, single row strip and double row strip. Paddy saline resistant culture 10,022 was raised in comparison with local Kullankar and it fared better by growing an acre yield of 1,563 lb. of grain.

At Nadukkuppam the farm was divided into blocks and an area of 2.17 acres was planted to 160 coconut seedlings during the year.

9. *Coconut development scheme.*—The coconut development staff did propaganda on all improved methods of coconut cultivation. Due to their intensive propaganda cultural practices were adopted by the coconut growers in 47,708.15 acres of coconut garden and an area of 37,727 acres was manured. Pests and diseases in coconut gardens of 39,706.25 acres were brought under control. Irrigation facilities were provided for an area of 16,613 acres. A total number of 1911 uneconomic palms were removed during the year. Special advice was given to cultivators for raising subsidiary crops in the properly spaced coconut garden after adequate manuring.

*Oilseeds crops.*—Experiments and research.

A. *Groundnut.*—Research work on groundnut was in progress with the main object of evolving strains with high yield, oil content, shelling outturn and resistance to pests and diseases. Work on the agronomic aspects of the crop was also continued.

The spreading selection AH. 6857 (East Africa) found consistently superior to all the three standards in three years of trial and recording an average increase of 44.3, 32.7 and 28.7 per cent over local, strains TMV.1 and TMV.3 respectively was multiplied for trials in the districts during 1960-61. Two selections in bunch and nine of the spreading were under different stages of yield trials, in comparison with their respective standards. One of the bunch selections, viz., A.H. 6875 recorded 2.8 per cent increase over TMV.2 and was on a par with it. In the yield trials of nine selections of the spreading variety the differences between the treatments did not attain the level of significance. One of these, viz., A.H. 6885 in the third year of trial registered an average increase of 37.7, 16.4 and 25.6 per cent over local and strains TMV.1 and TMV.3 respectively. This will be multiplied for field tests in ryots' holdings during 1961-62. Five spreading selections that out yielded local in replicated row trials conducted during 1958-59 were multiplied. In the new cultural trials with four main and two sub-treatments conducted for the third year, the yield differences were not significant both in the main and sub-treatments. In the spacing trials with the spreading groundnut broader spacings of 24" x 3", 18" x 4" and 12" x 6" recorded 12.9, 6.9 and 4.4 per cent over the spacing of 9" x 8" (Control). In the fertilizer placement trials with two manure mixtures and three placements with the bunch, the yield differences were not significant. However cattle manure at 5 tons per acre recorded the highest yield, giving an increase of 13.1 per cent increase over 'No manure' (Control), in the bunch and treatment 'MM.2 broadcast' in the spreading variety registered the highest increase

of 19.2 per cent over control. A new experiment on legume rotation with six main three course rotational treatments with all the three phases represented as sub-plots was repeated for the third year. Twelve high yielding selections comprising four in each of the bunch, semi-spreading and spreading varieties were field tested in 26 centres in the districts. The bunch selections registered increased yields ranging from 8.7 to 91.7 per cent, the semi-spreading selections recorded increases ranging from 3.4 to 77.8 per cent and the spreading selections recorded increased yields ranging from 5.8 to 66.7 per cent over the local varieties. A high yielding bold seeded semi-spreading selection A.H. 6719 awaits release as a new strain suitable for dessert purposes under the trade name H.P.

*B. Gingelly.*—In 1959-60 cold weather season five selections were compared in yield trial with local and strains TMV.2 for the first year. The yield differences were significant. Four out of the five were significantly superior to both the standards, yielding 11.6 to 32.9 per cent more than local. Twelve selections were compared with local and TMV.2 in two series of preliminary yield trials. The yield differences were not significant, though 11 out of 12 recorded increased yields up to 37.5 per cent over local. In addition 29 selections were studied in two series of replicated row trials.

In 1960 summer season ten selections were compared with strain TMV.3 in two groups of yield trials. Of these, six were tested for the third year and the other four advanced from 1958 summer for the first year. Ten and 47 selections were also tested in two series of preliminary yield trials and three series of replicated row trials in comparison with strain TMV.3. Thirty-one varieties and two X-ray induced mutants and their parents were also studied in great detail. The X-ray induced mutants did not reveal any appreciable differences in yield when compared to strain TMV.2. Eighty-five selections from the F<sub>2</sub> progenies of crosses designed for the evolution of white seeded cosmopolitan strains were studied. In addition, 14 fresh crosses were made for the same purpose. The new manurial experiment was repeated for the Third Year.

*C. Castor.*—Two short duration selections, R.C. 1146 (X-118/1—Horticultural type × TMV.1) and R.C. 1147 (X-99/477 Namakkal × Kumbakonam) maturing in 5½ months and recording increased yield of 18.4 and 18.8 per cent respectively over TMV.2 in three years of yield trial at the Agricultural Research Station, Tindivanam were multiplied for trials in the ryots' holdings in the districts during 1960-61. Three selections were tested in yield trials for the second year. The yield differences were not significant. Four of the seven registered increased yields up to 15.2 per cent over the general mean taken as the standard. Five out

of the eight selections studied under replicated row trials yielded 7.0 to 43.6 per cent more than the general mean and were on a par with it.

The three short duration cultures R.C. 1074, 1075 and 1076 recorded increased yields ranging from 4.9 to 16.3 per cent in Mathurai, 34.4 to 98.8 per cent in North Arcot and 97.8 to 176.9 per cent over local in Salem district. These three cultures and two others R.C. 1146 and 1147 were issued for trials in 17 centres in the districts. One hundred and sixteen single plants were advanced for further study from F<sub>2</sub> and F<sub>3</sub> progenies of crosses designed for the same purpose. Ten families of hybrids from the crosses between highly pistillate strain MV.1 and ten high yielding inbreds were compared with TMV. 1 both in compact family blocks and replicated row trials. The yield differences were significant in both the trials. Cross × 247 (TMV.1 × R.C. 820 Russian 13) exhibited superior performance in both the trials. Sib × 247/3 in this cross recorded the highest yield of 53.0 per cent increase over TMV.1. In the manurial trial conducted for the sixth year, the differences in yield due to treatments were significant and treatments NP, NPK, NK and N were significantly superior to 'No manure' (Control) recording increased yields ranging from 150.3 to 178.8 per cent over control.

*D. Miscellaneous crops—(i) Doum Palm.*—The palms at the Agricultural Research Station, Tindivanam continued to be in good condition.

(ii) *Vegetables.*—Varieties of vegetables were raised at the Agricultural Research Station, Tindivanam and the produce and seeds were distributed to the public.

(iii) *Paddy.*—strain TK 6 was raised in an area of 2.06 acres which recorded an average yield of 1933 lb. of grain and 2,900 lb. straw. The yield was low due to late planting.

*E. Miscellaneous work—(i) Advisory work.*—Enquiries regarding the cultivation, supply of oilseeds including coconuts received from cultivators of this and other States and from Indian Council of Agricultural Research and Indian Central Oilseeds Committee were attended to promptly. The batches of Gramasevaks and Agriculturists from the Community Development Blocks were taken round the Central Exhibition and the activities of the Section explained to them.

(ii) *Exhibition.*—The World Agricultural Fair Exhibition was arranged in New Delhi for the first time which represented the global progress in agriculture. All the States in India participated in the Exhibition. The Madras State also had its pavilion depicting the achievements and progress of work in the Oilseeds Wing of the Department were prepared and put up.

(iii) *Committee meetings*.—The Oilseeds Specialist, Coimbatore, attended the following meeting of the Commodity Committees :—

*Dates—*

Indian Central Coconut Committee, 9th January 1960.

Indian Central Oilseeds Committee, 19th January 1960.

(iv) *Lectures*.—The Oilseeds Specialist gave special lectures to the Second and Third Year B.Sc. (Ag.) students during the period on the Agronomy, Breeding and genetics of oilseeds crops. Practical classes were also held to demonstrate crossing and selfing techniques, identification of strains, range of plant characters, etc., relating to oilseeds crop. Practical classes were also conducted for the final year B.Sc. (Ag.), students undergoing farm training. Classes were also taken for the trainees in the Post-Graduate Institute.

*F. Seed distribution*.—The following quantities of seeds and plants were distributed during the period :—

|                              | LB.    |
|------------------------------|--------|
| Groundnut pods .. .. .       | 4,242  |
| Groundnut kernels .. .. .    | 117    |
| Gingelly .. .. .             | 2,797  |
| Castor .. .. .               | 2,050  |
| Paddy .. .. .                | 6,968  |
| Cholam, Co. 19 .. .. .       | 242    |
| Red gram S.A. 1 .. .. .      | 106    |
| Gliricidia seeds .. .. .     | 14     |
| Sesbania seeds .. .. .       | 22     |
| Bhendai seeds .. .. .        | 3      |
| Ragi A.K.P. 1 .. .. .        | 5      |
| Kapok seeds .. .. .          | 74     |
| Gliricidia cuttings .. .. .  | 4,752  |
|                              | NOS.   |
| Gliricidia seedlings .. .. . | 5,600  |
| Sesbania seedlings .. .. .   | 18,400 |
| Neem seedlings .. .. .       | 200    |
| Pungam seedlings .. .. .     | 250    |
| Kapok seedling .. .. .       | 200    |
| Cassia seedlings .. .. .     | 200    |
| Prosopis seedlings .. .. .   | 100    |
| Guinea grass slips .. .. .   | 300    |
| Tomato seedlings .. .. .     | 50     |

A total number of 99,421 quality coconut seedlings were distributed from the different nursery centres during the year under report.

*Results of practical value—A. Groundnut*.—The spreading selection A.H. 6857 (East Africa) found consistently superior to all the three standards in three years of trial recording an average increase of 44.3, 32.7 and 28.7 per cent over local strains TMV. 1 and TMV. 3 respectively was multiplied for trials in the districts during 1960-61. In the spacing trials with spreading variety broader spacings of 24"×3", 18"×4" and 12"×6" recorded 12.9, 6.9 and 4.4 per cent respectively over 9"×8" (Control). Application of Boron at the rate of 10 lb. acre to the Soil appears to improve germination and flower production. In the semi-spreading type of groundnut the occurrence of red testa colour was recorded in three collections, one from China, and two from Sudan, and purple testa in a variety from Thanganyika. A triploid hybrid (2n—30) was obtained by crossing A. Hypogaea (2n—40) with A. villosa (2n—20). This hybrid was back crossed as the male parent to the bunch groundnut. One plant of the progeny was a fertile synthetic tetraploid (2n—40) groundnut. It possessed the spreading and a few other leaf and flower characters of the wild parent villosa with the other characters of cultivated groundnut. Studies on breeding aspects of groundnut were also in progress under the scheme for intensive breeding of groundnut and a scheme for improvement of Pollachi red groundnut.

*B. Gingelly*.—Eighty-five selections from the F<sub>2</sub> progenies of Crosses designed for the evolution of white seeded cosmopolitan strains were studied. Under the scheme for intensive breeding of sesamum, ten crosses and ten reciprocal crosses were made between the local and selected parents possessing economic characters. The studies are in progress.

*C. Castor*.—Two short duration selections, viz., R.C. 1146 and R.C. 1147 maturing in 5½ months and recording 18.4 and 18.8 per cent increases respectively over TMV. 2 in three years of yield trial were multiplied for trials in the cultivators' holdings in the districts during 1960-61. One hundred and sixty-one inbreds were maintained pure. Twenty-two fresh crosses were made between selected parents to reduce the duration and to impart colour to the existing strains. Castor Crop appears to respond well to manuring and trials to investigate this aspect are in progress.

BRIEF SUMMARY OF THE ACTUAL PROGRESS OF RESEARCH IN THE OILSEEDS SECTION DURING THE PERIOD.

1. *Oilseeds Section, Agricultural College and Research Institute, Coimbatore.*

*A. Gingelly*.—Single plant selections numbering 70 were made during the period for characters like resistance to shoot webber attack, close setting of capsules and 6-8 loculed nature. The

sesamum mutants received from the Bose Research Institute Calcutta, were studied in detail with the existing strains. The mutants were in no way superior to the strains. However estimation of their oil content remains to be done. If the mutants contain high percentage of oil they can be taken into consideration for large scale production and distribution in the State.

*B. Castor.*—Three line selections for economic characters like earliness and good setting of capsules were made. Also a few lines with triple bloom nature have been spotted out in the F<sub>3</sub> population of the cross made between C.3 (Pakistan), E.B. 26/1 (Madhya Pradesh) and TMV. 1 (Madras) for inducing jassid resistance character. Of the sixteen selections tested, five received from the Indian Agricultural Research Institute were found to be shorter in duration maturing in 4½ months. Single plant selections were made from the five promising varieties which were shorter in duration.

## 2. Agricultural Research Station, Tindivanam.

*A. Groundnut.*—An East African Selection, viz., A.H. 6857 was found to be consistently superior to all the standards in three years of trials and recorded an average increase of 44.3, 32.7 and 28.7 per cent over local strains TMV.1 and TMV.3 respectively. The selection was multiplied for trials in the districts during 1960-61. Broader spacings of 24" × 3", 18" × 4" and 12" × 6" in the spreading variety resulted in higher yields than in the case of the normal spacing of 9" × 8". In fertilized placement trials, cattle manure at 5 tons per acre recorded the highest yield of 13.1 per cent increase over 'No manure' (Control), in bunch, and treatment 'MM. 2', i.e., Manure Mixture No. 2, broadcast in the spreading variety registered the highest increase of 19.2 per cent over control. A high yielding bold seeded semi-spreading selection, viz., A.H. 6719 awaits release as a new strain suitable for desert purposes.

*B. Gingelly.*—Five Selections were compared in yield trial with local and strain TMV.2 in the 1959-60 cold weather season. In addition 29 selections were studied in two series of replicated row trials. In the 1960 summer season ten selections were compared with strain TMV. 3 in two series of yield trials. Thirty-one varieties and two X-ray induced mutants and their parents were raised and studied. The X-ray induced mutants did not show any appreciable differences in yield when compared to strain TMV. 2. The manurial experiment was repeated for the third year.

*C. Castor.*—Two short duration cultures, viz., R.C. 1146 and R.C. 1147 maturing in 5½ months recorded 18.4 and 18.8 per cent increased yield respectively over TMV. 2 in three years of yield trial. The cultures were multiplied for trials in the cultivators' holdings in the districts during 1960-61. The three short duration

cultures, viz., R.C. 1074, 1075 and 1076 recorded increased yields ranging from 4.9 to 16.3 per cent in Madurai, 34.4 to 38.8 per cent in North Arcot and 97.8 to 176.9 per cent in Salem district over the local varieties. In the manurial trial conducted for the sixth year, the differences in yield due to treatments were significant and treatments NP, NPK, NK and N were significantly superior to 'No manure' (Control) recording increased yields ranging from 150.3 to 178.8 per cent over control.

## STEPS TAKEN TO DISSEMINATE THE RESULTS OF RESEARCH.

(a) *Production of nucleus seeds of the improved strains.*—The primordial nucleus seeds of the improved strains of groundnut gingelly and castor were produced and multiplied at the Agricultural Research Station, Tindivanam. In the zonal nucleus seed farms large scale production of nucleus seeds of the improved strains of groundnut and castor was continued. The entire development work was carried out by special development staff stationed at each district headquarters. Selected coconut seedlings were produced at five nursery centres located in the important coconut growing regions of the State and supplied to the ryots. Further intensive propaganda on the improved methods of coconut cultivation was made by Coconut Development Assistants at each district centre.

(b) *Whether the results of research have been transmitted to ryots.*—(1) *Groundnut.*—The promising spreading selection A.H. 6857 will be studied in the district in the cultivators field. The large seeded selection A.H. 6719 has reached the strain states and it is to be given a strain number shortly for taking up large scale multiplication of seed.

(2) *Gingelly.*—The results are yet to be transmitted to the ryots.

(3) *Castor.*—The result of fertilizer application to castor has been published in the fertilized news journal. Trials are being repeated to get further conclusive results.

(c) *The economic gain to ryots by the adoption of the above results.*—The cultivation of the spreading selection of groundnut is likely to give 20 per cent increased yield over the local. The large seeded selection of groundnut can be used for desert purposes. Fertilizers application to gingelly and castor is likely to increase the production by 10 per cent.

## D. Cotton.

1. *Research (main features).*—The programme of work covered both fundamental research and breeding work for evolution of improved strains for the different tracts. In the sphere of fundamental research, work was concentrated on isolation of a perennial type suitable for cultivation in the backyards, introducing wild

genes of varied potentialities like resistance to pests and diseases, lint strength, fineness and ginning percentage on to cultivated species and synthesising Asiatic—American Cottons to combine the superior lint qualities of American cottons with the resistant capacities of Asiatic cottons. Comprehensive study was also made on heterosis, parthenogenesis, cytogenetics and other studies to gain practical knowledge on fundamental studies.

Breeding work was directed to evolve strains not only for quantity but also for superior quality. Special mention may be made of the breeding work done at Srivilliputhur which aimed at evolution of 1-3/16" staple, highest target aimed at in India. The summer Cambodia tract was found to have the special environment for production for extra long staple cottons. Another notable feature in the breeding work was the attempts made to evolve a cosmopolitan strain for the entire desi tract with a staple length of 1-3/16" which is again a high target aimed at in Desi cottons. Maintenance of purity of improved strains year after year and large scale multiplication and distribution of such pure seeds also engaged attention in the section.

The various breeding and multiplication schemes jointly financed by the Indian Central Cotton Committee were within the fold of section work besides the research work done under the auspices of State Department.

2. *Schemes*.—Salient features of the work done by the section may be summarised as follows:—

(1) The scheme for evolution of extra long staple cotton continued to function at Srivilliputhur. This has its objective the production of a cotton with 1-3/16" staple, suitable for irrigated summer zone. This is a project for stepping of production of cotton of category of 1-3/16" in India and Srivilliputhur is one of the three centres in India selected for the above work. A total area of 0.75 lakh acres under irrigated summer Madras Uganda would benefit out of this project.

(2) The scheme financed by Indian Central Cotton Committee for evolution of a suitable early type of American Cotton to fit in as off-seasonal crop in the rice fallows continued till 31st October 1959 when the scheme was terminated. The main outcome of the scheme was the recommendation of P216 F for rice fallows over a lakh of acres in Madras State.

(3) The Karunganni Improvement Scheme at Koilpatti, Tirunelveli district financed by Indian Central Cotton Committee with its modified objective as the evolution of a cosmopolitan strain with 1-1/16" in length, spinning capacity of 40s; ginning percentage of 33 and giving an yield of 125 lb. lint per acre continued to function during the period. This is intended to benefit an area of 5½ lakh acres under unirrigated Desi (Karunganni) in the State.

(4) The unirrigated cambodia scheme jointly financed by Indian Central Cotton Committee with its headquarters at Periakulam continued to function. This is intended to benefit an area of nearly a lakh and half acres under unirrigated American cotton in the Madras State.

(5) In order to multiply the seeds of Karunganni-2 and MCU.2 the scheme K2 and MCU.2 continued to function at Kovilpatti. This is also partly financed by Indian Central Cotton Committee. Nucleus and Foundation stocks for these strains to keep up waves of multiplication are maintained at Agricultural Research Station, Kovilpatti.

(6) The multiplication work for the improved strains MCU.1 and K5 was continued at Trippur under the scheme for multiplication and distribution of K5 and MCU.1 jointly financed by Indian Central Cotton Committee. Nucleus and Foundation stocks for these two are maintained at the Cotton Breeding Station, Coimbatore.

(7) In view of the superior quality of the strains, MCU.1 and MCU.2 they had been exempted from price control and a scheme was brought out in 1951 fully financed by the State Government, known as certification scheme. The scheme aimed at certifying such cottons so as to exempt these strains from price control and help the ryots and merchants to get higher price for such cottons. This scheme is being continued year after year. The imposition of ceiling during this year resulted in the poor response for registration for lint certification.

(8) The continuance of the Khadi Scheme at Tiruppur facilitated purchase of large quantities of Karunganni lint for Khadi industry. Incidentally it helped in having a better control over seed for procurement needs under multiplication schemes.

3. *Seed Supply*.—Seeds of the perennial type MOCO were supplied to the Agricultural Research Stations for testing its performance and multiplication of seeds. Indents received from the Director, Bose Institute, Calcutta for supply of wild cottons for cytotaxonomical studies were complied with fourteen varieties from Germplasm bank were supplied to Cotton Breeder, Hansi, Punjab for maintenance.

*Total Quantity of seeds of improved strains distributed during the period.*

|                         |                     |
|-------------------------|---------------------|
| MCU1.—15,008 (100 lb.). | } Quantity in bags. |
| K5.—7,376 (100 lb.).    |                     |
| K2.—10,652 (112 lb.).   |                     |
| K6.—1,668 (112 lb.).    |                     |
| MCU.2.—9,494 (98 lb.).  |                     |

4. *Result of research achieved.*—Actual progress made and results of research achieved.—(a) The screening for a pure and typical MOCO was continued and MOCO 12 and MOCO 13 were found to be perennial in habit and pure for morphological characters. The germplasm bank of 26 varieties was intensively studied for exploring the possibilities of recommending a perennial cotton superior to MOCO. But none of them was found to be outstanding in performance. Three old perennial types, viz. Exotic-3, Dharwar American and American Barbandy proved better than MOCO for general cultivation. This requires further trial in the districts.

(b) The possibility of parthenogenic induction was found to be very remote and the attempts made to induce parthenogenesis were not successful.

(c) The lint quantity gene assorted independent of leaf, lobing, petal, colour and anthiveyanin pigment.

(d) There was no manifestation of hybrid vigour in the hybrids involving 9030 G, P. 216 F. Lakshmi, MCU 1 and MCU 2 studied under replicated conditions.

(e) The wild cotton derivatives involving darwini X taitense and raimondi with MCU. 1. and MCU. 2. were significantly superior in length or ginning, but were equal in yield to the control. Among the arboreum-anomalum hybrids, cultures with high degree of fineness and strength were carried forward for further study.

(f) The cytological studies indicated that the chromosome behaviour in the sterile hybrids revealed associations ranging from univalents to hexavalents—resulting in unbalanced and unviable gametes causing sterility.

A new technique of leaf tip squash preparation was attempted for preparing mitotic plates. The technique was successful but it required to be perfected.

(g) The observations made on the plants suspected to be triploids of Asiatic and American Origin proved to be maternal.

Mass scale crossing between Asiatic and American Strains and Back-crossing on sterile hybrid were continued. Setting was rare and a few burst bolls were obtained to be tested for hybridity in the next season.

(h) Nothing noteworthy was obtained from the study of megaporesis.

(i) A simple device for measuring fineness was fabricated on the principle of time taken for air under a particular pressure to fall to a lower pressure when passed through a known weight of processed lint. The instrument was found to be fit for measuring fineness but it required to be perfected for determining extreme grades of fineness.

(j) The studies on grafting in cotton were discontinued as the item was not included in the new three-programme.

II. In the Breeding of Extra Long Staple Cotton at Srivilliputhur promising cultures like 0892. B, LO. 318. W. EL. 192 which recorded superior length (More than 1.02 inch) combined with better yield, fineness and strength have been raised in the Main strain trial for further test. The cultures included under progeny row Trial during the season are noteworthy for their superior length conforming to the objective of the scheme.

III. P. 216 F. was found to be the best for cultivation under rice fallows. The scheme was terminated as the objective for breeding an early variety suitable for rice fallows was fulfilled.

IV. The breeding for improvement of Karunganni and Tirunelveli was in progress and two new strains 9978-B-5 and 9705-C. were found to be on a par with the standard in production. Strain 9833-4, newly advanced to the Main strain trial significantly excelled the standard in yield, length and ginning.

V. In the Breeding Trials for improvement of unirrigated cambodia, 9030 G. was found to be superior and adaptable to the rainfed conditions also. Strains, PK. 860, PK. 863, and PK. 1053 studied in Main Strain Trial excelled the targets fixed for yield while combining superior fibre properties.

*Transmission to ryots.*—The research work done at the Cotton Breeding station was of a fundamental nature and hence had not reached the domain of practical utility to the farmer. As a result of intensive breeding work done under the scheme for evolution of a long staple cotton as a winter crop in the central districts and the scheme for improvement of Tinnevelia and Karunganni cotton in Madras State, two new strains were released for general cultivation, viz. 9030 G. or Pongal for the irrigated winter tract of Cambodia and K6 (Pandyan) for the entire desi tract. The multiplication of the seeds has been taken up under the seed multiplication schemes. Another notable feature is the recommendation of P216 F for rice fallows. This would fit in as the best crop for rice fallows extending over an area of one lakh acres in Madras State.

*Economic gains to the ryots.*—The replacement of two existing strains K2 and K5 by the new strain K6 (Pandyan) in the entire Karunganni tract of 7 lakh of acres is expected to result in an additional production of about 33,000 bales of lint of the long staple category, benefiting the growers to an extent of 1.72 crores annually. The new strain Pandyan would fetch an additional income of Rs. 40 per acre due to an extra yield of 25 lb. of lint per acre.

The spread of the new strain in 9030G over 8.5 lakhs acres under irrigation in the winter cambodia zone is expected to secure an additional income of Rs. 1.96 crores to the cotton growing community in the region. An extra income of Rs. 56 per acre will be obtained by the ryots by growing this strain. The new strain would give 7 per cent increased yield and an extra production of 30,000 bales of lint. A net gain of Rs. 200 per acre is estimated by growing P. 216 F. Cotton in rice fallows over an area of one lakh acres in Madras State. This will result in an additional production of at least 25,000 bales of lint.

#### *E. Sugarcane.*

*Central Sugarcane Research Station, Cuddalore—Season.*—There was a total rainfall of 47.15 inches (1178.75 m.m.) on 51 rainy days during the year as against 36.55 inches (916.75 m.m.) on 56 rainy days in the previous year. Though the rainfall received this year surpassed last year's receipt it was an ill distributed one. Nearly one-fifth of the total rainfall was received during the months of August-September. This was combined with high winds which resulted in heavy lodging of canes and inundation of experimental plots. Summer was severe with oppressive heat and hot winds which necessitated, pressing of oil engines to maximum possibility to irrigate both the standing canes of 1959-60 season and young planted crop of 1959-60 season.

(a) *Agronomy—(i) Varietal (Selection and Distribution).*—Thirty-two Coimbatore varieties from Co. 1274 to Co. 1308 (Except Co. 1294, Co. 1300 and Co. 1306) and eleven foreign varieties were put under multiplication.

One hundred and eight varieties were under study during the period of which 93 were Coimbatore varieties and 15 of foreign origin. Besides these, 36 varieties received during 1959 were also under study. Highest germination percentage of 98.33 was recorded by Co. 1252 and the lowest of 32.71 by Co. 1208. Good tillering was noticed in 51 Coimbatore varieties and four foreign Q. 50, C.P. 44/153, CP 47/193 and Co. 339. Out of the 108 varieties, 37 varieties arrowed. Profuse arrowing to the extent of 25 per cent was recorded by Co. 1213 and CP. 44/153. Early shoot borer incidence of 4.6 per cent in Co. 1214 to 20.6 per cent in Co. 1174 was noted while the standards Co. 419, Co. 449 and Co. 527 recorded 8.8 per cent, 8.1 per cent and 9.1 per cent respectively. Incidence of top-borer ranged from 5.4 per cent in Co. 1209, to 55.3 per cent in Co. 1204. Thirty-one varieties recorded more than 20 per cent incidence of top borer. Twenty-seven varieties were susceptible to smut out of which Co. 1212, Co. 1215, Co. 1217 and Co. 1241 recorded 70.3 per cent, 20.3 per cent 10.6 per cent and 17.9 per cent respectively. Top rot was noticed in Co. 1177, Co. 1178, Co. 1179, Co. 1197, Co. 1200, Co. 1208, Co. 1212, Co. 1214,

Co. 1215, Co. 1216, Co. 1222, Co. 1226, Co. 1228, Co. 1241, Co. 1245, Co. 1252, Co. 1256 and Q. 49. Mosaic was noticed in all the varieties.

Based on their quality, yield, field habits and resistance to pests and diseases, the following varieties were selected for early and late seasons.

*For Early Season.*—Co. 1202, Co. 1206, Co. 1214, Co. 1234, Co. 1235, Co. 1253, Co. 1254, Co. 1256, Co. 1262, Co. 1266, Co. 1269, CP. 29/320, N. Co. 291 and Q. 49.

*For late season.*—Co. 1187, Co. 1202, Co. 1205, Co. 1220, Co. 1249, Co. 1253, Co. 1254, Co. 1255, Co. 1271, Co. 1273, Q. 49 and Pindar.

*Varietal trials—Early.*—In the preliminary yield trial early no variety proved superior to the standards in respect of yield of cane. However Co. 1178 recorded the maximum of 6.3 tons of commercial cane sugar per acre. CP. 34/79 recorded the best juice quality with 19.08 per cent sucrose and 90.76 per cent purity followed by Co. 1178 with 18.65 per cent sucrose and 88.87 per cent purity. In the main yield trial, early variety Co. 740 recorded the maximum yield of 53.8 tons per acre but was on par with Co. 527 and Co. 449. Variety Co. 1001 recorded the maximum commercial sugar of 5.61 tons per acre. Best juice quality was noticed in Co. 658 followed by Co. 997.

*Varietal trials—Late.*—In the preliminary yield trial late, variety Co. 1176 recorded the maximum yield of 54.8 tons per acre among the varieties tried and was on par with the standard Co. 419 which recorded 56.2 tons per acre. Variety Co. 1221 recorded the maximum commercial cane sugar of 6.81 tons per acre and the best juice quality with 19.51 per cent sucrose and 86.16 per cent purity. In the Main yield trial late, Co. 782 recorded the maximum yield of 38.2 tons per acre. Co. 449 recorded the maximum yield of 38.2 tons per acre. Co. 449 recorded the best juice quality with 17.76 per cent sucrose and 90.18 per cent purity followed by Co. 810 with 17.79 per cent sucrose and 82.32 per cent purity. In the Adsali varietal trial, Co. 740, Co. 782 and Co. 853 were found promising in respect of yield and commercial cane sugar. Varieties Co. 658 and Co. 997 were good quality canes recorded over 16 per cent sucrose and 85 per cent purity as early as November in Adsali season.

(ii) *Manurial trials.*—In the Alternate source of Nitrogen trial, inorganic fertilisers like Urea, Ammonium Sulphate Nitrate and Calcium Ammonium Nitrate were found as good as Ammonium Sulphate for sugarcane both in respect of yield and quality. In times of scarcity of Ammonium Sulphate, resorting to the other nitrogenous fertilisers is only to the advantage.



In 'The response of Sugarcane to phosphate trial' there was not much difference in yield. Under South Arcot district conditions, sugarcane does not respond much to the phosphatic fertilisers. There was only a very little improvement in quality.

(iii) *Cultural trials*.—In 'the propping and trashing trial', no propping and no trashing gave the maximum yield on commercial cane sugar, followed by trashing and propping by trash twist methods. In the Mulching trial yield differences could not be noticed between the treatments. However trash mulching cane ridges had its own good effect by smothering the weed growth and preservation of soil moisture which resulted in saving 6-8 irrigations till the break of monsoon. In the Weedicide trial spraying with 2-4-D and M.C.P.A. were found to control the weeds to a certain extent only. Trash blanketting could be adopted to control weed growth and attack of early shoot borer, more economically.

(b) *Chemistry*.—(1) *Nutrition trial*.—The trial was laid out in split plot design with 0, 50, 100, 150, 250 and 350 lb. N. per acre with basal application of phosphate and potash for the last three levels of nitrogen. The yield data showed that in the case of Co. 419 increasing the application of nitrogen up to 150 lb. per acre increases the yield of cane, after which there is no further marked increase and in the case of Co. 449 increasing the application of nitrogen up to 250 increases the yield of cane, after which there is no further increase. Application of phosphate and potash has increased the yield at 3 levels of nitrogen, viz., 150, 250 and 350 in the case of Co. 419 while in the case of Co. 449 at 150 lb. N level the potash and phosphate has increased the yield. At 250 and 350 N levels the application of phosphate and potash decreases the yield.

(2) *Foliar spraying of nitrogenous fertilisers*.—The experiment was laid out in duplicate observation plot with the variety Co. 419. The treatments consist of 4 major ones, viz., Soil applications of 0, 25, 50 and 75 lb. N per acre and 61 minor ones, viz., Foliar application of 0, 10, 20, 30, 40 and 50 lb. N per acre. Spraying was commenced on the 90th day and was completed on 150th day after planting at an interval of 8 days at 10 lb. N per acre each time.

The yield data showed that there was a marked increase in yield due to application of small doses of Nitrogen (30 to 50 lb.) per acre as foliar spray with or without soil application.

(3) *Grade dose of nitrogen*.—(0 N to 500 lb. N per acre were applied to sugarcane with an increase of 50 lb. N per acre to each plot with two varieties Co. 419 and Co. 449 in the observation plot laid out to study the response of sugarcane to graded dose of nitrogen. The yield data showed that the response to N is better in Co. 419 than in Co. 449 especially for the lower doses of nitrogen.

At very high dose of 450 and 500 lb. N per acre the yield is somewhat depressed in both varieties.

(4) *Laboratory work*.—More than three thousand samples of sugarcane juice were analysed during the year. These were drawn from different experiments relating to Agronomy, Chemistry, Entomology and Mycology trials.

Besides, studies on moisture index, leaf analysis for estimation of N content, soil analysis were undertaken. Studies on moisture content of standard leaf sheaths showed that Co. 419 recorded higher moisture content throughout than Co. 449. The moisture index for Co. 419 and Co. 449 is 73 per cent to 75 per cent at the time of harvest. It is also seen that N manuring generally increases the moisture content. The effect of potash and phosphate is not consistent.

In February, the moisture level falls to 73 to 75 per cent in the early maturing variety Co. 449 and this is noticed in March in the case of Co. 419 the late maturing variety.

(c) *Entomology*.—Detailed observations on the incidence of Early shoot borer, top borer and internode borer in eight promising varieties, showed that Co. 997 and Co. 726 recorded high incidence of early shoot borer, while top borer was more in Co. 527 and Internode borer was more in Co. 997. The analysis of juice of healthy and top borer affected canes at harvest revealed that there was significant lowering of quality of juice in top borer infested canes. The early plantings escape the early shoot borer attack while late plantings in hot weather (April to June) suffer more.

Four broods of top borer were noticed in this tract. The first brood commenced from the second week of August and ceased by first week of September. The second brood from first week of November to first week of January. The second brood from first week of February to second week of March and the fourth brood from first week of April to first week of May. The top borer life history study showed that the egg period lasted from 6-9 days, larval period 31-40 days and Pupal period 11-17 days.

The chemicals, Endrin 0.1 per cent spray, DDT 0.25 per cent spray and BHC (EC) 5 lb. soil application at planting were found to be effective in controlling early shoot borer. No insecticide tried was effective against top borer. The investigations on natural enemies on Top borer showed that *Telenomus beneficians* was more common than *Tetrastichus schoenobi* on eggs, *Elasmus Zehntnerii*, *Stenobracon* sps. and *Rhaconotus* sps. on larvae.

The minor pests—Termites, white-fly and Pyrilla were noticed in stray cases. On observation it was noticed, that Pyrilla preferred aged crop and large green foliated varieties for harborate. The incidence of Rootknot nematode is light and the affected plants



do not show any external symptom. The survey on sugarcane pests reveal that there is heavy incidence of early shoot borer in South Arcot and Thanjavur districts and high incidence of Top borer in Tiruchirappalli and South Arcot and internode borer is seen all over. Minor pests are very stray, except slight incidence of Whitefly in Thanjavur.

(d) *Mycology—Smut.*—Of the twelve varieties tested in the early series, Co. 527 continued to be resistant to Smut while Co. 740 has recorded the maximum incidence of 35.9 per cent. In the late series, Co. 419 recorded the maximum incidence of 11.11 per cent. During the current seasons 16 varieties are being tried, and so far Co. 527 was found to be free from smut. Further observations are under progress.

The first ratooned crop was harvested. Smut incidence was recorded only in Co. 419 and Co. 449. A new experiment was started during the period under report with Co. 419, Co. 449, Co. 527, Co. 658 and Co. 785. No incidence of Smut was noticed. The experiment is in progress.

*Pine apple disease.*—In the fungicidal trial for the control of pine apple disease, the germination was found to be the highest in Co. 658. The setts treated with Aretan, Agallol and Harvesan gave increased germination. Of the five varieties of standing canes tested for their resistance to pine apple disease the length of lesion was found to be highest in Co. 449 and lowest in Co. 785.

*Other diseases.*—No Wilt incidence was observed in all the treatments. Rust was observed on the following new varieties Co. 1238, Co. 1240, Co. 1243 and Co. 1248. Bordeaux mixture, 1 per cent was found to be effective in controlling the Top rot disease of sugarcane. None of the varieties released in 1958 and 1959 was free from Mosiac. The incidence of Smut, top rot and Rust have been recorded in several of the new varieties received from sugarcane Breeding Institute, Coimbatore, 1959 and 1960.

*Scheme for analysis of physical and chemical criteria of gur.*—A scheme for studying the physical and chemical criteria of Gur leading to the formulation of basis of Gur grading was sponsored by the Indian Central Sugarcane Committee and its functioning in Madras State at the Central Sugarcane Research Station, Cuddalore, from June 1959 onwards.

During the period under report a total of 33 duplicate samples of gur of special and main season were collected from gur producing centres, viz., Coimbatore, Velur (Salem district), Karur, Udumalpet, Gudiyatham, Nilakottai and Tiruchirappalli. Out of 33 samples 24 samples from the variety Co. 419, the rest are from Co. 449 and Co. 527. One set of samples are being analysed at monthly intervals for their physical properties and chemical criteria.

The colour of the gur is bright if hydros is used but the quality is poor in general. If lime is used the colour of the gur is dark but the quality is good and the taste of the gur is very sweet. Gurs prepared using hydros in excess cannot be stored for a long time. Moreover the colour gets darkened and the quality deteriorates in the long run.

*Sugarcane Research Station, Gudiyatham—Season.*—The season during the period under report had been very unfavourable. The rain fall during the both the south-west and north-east monsoon periods being very poor and ill distributed. The total rainfall received during the entire period under report was only 22.11 inches as against 33.90 inches received during the corresponding period of the previous year. Unlike in the previous years, the farm did not also get the benefit of irrigation water from the Gudiyatham tank due to the very inadequate and ill-distributed rainfall. Severe drought conditions prevailed almost throughout the years and consequently acute water scarcity was experienced. One out of the two existing wells of the farm had completely dried up. The entire standing crop of sugarcane and other crops had therefore to be maintained with the inadequate water available in the other well. Steps have been taken to put up a borewell and a filter point to improve the irrigation facilities.

*Experiments.*—Thirty-two new Coimbatore cane varieties of 1959 release were received from the Sugarcane Breeding Institute, Coimbatore, and were multiplied for varietal study.

Seventy-one varieties were under trial in the varietal study plots, under normal conditions of irrigation and manuring for the selection of varieties suitable for the tract and for crushing during the early, mid and late season. Based on the yield, juice quality and other economic characters like tillering, arrowing, etc., seven varieties, i.e., Co. 1223, Co. 1245, Co. 1248, Co. 1254, Co. 1255, Co. 1260 and Co. 1270 suitable for crushing early in the season and eight varieties, i.e., Co. 1243, Co. 1247, Co. 1252, Co. 1259, Co. 1262, Co. 1271 and Co. 1279 for late season, crushing were selected and promoted to the next stage of preliminary yield trial.

In the preliminary yield trial of early varieties, out of the eight varieties under trial, none of the varieties proved to be superior to the controls Co. 339 and Co. 527. The six varieties Co. 1166, Co. 1186, Co. 1125, Co. 1152, Co. 1204, and Co. 1261 were selected and are being multiplied for promotion to the next stage of trial. The variety Co. 1166 recorded over 40 tons of cane per acre and all were statistically on a par.

In the preliminary yield trial of late varieties, ten varieties were under trial. Though the yield differences were statistically significant the yield of these varieties under trial was generally poor due to the severe drought conditions. Co. 1205 recorded the maximum

yield of 30.07 tons. Co. 1169 recorded the best juice quality with 18.29 per cent sucrose and 12.85 per cent C.C.S.

In the Main Yield trial of early varieties out of the six varieties under trial compared with Co. 419 and Co. 449, Co. 658 recorded the maximum yield of 45.03 tons. Co. 740 also gave a good yield of 43.18 tons of cane per acre. This is the second year of trial.

In the main yield trial of late varieties four varieties were compared with Co. 419 and Co. 449. The yield differences were not statistically significant. However Co. 1044 recorded the good yield of 40.82 tons per acre as compared to the control Co. 419 with only 36.97 tons. Co. 1044 also recorded very good juice quality with 4.95 tons of C.C.S. per acre as compared to 4.10 tons in Co. 419.

In the study for the maturity observation of early varieties Co. 740 recorded the maximum sucrose of 19.96 per cent Co. 785 was the next best with 18.46 per cent sucrose in the month of March. All the varieties attained peak maturity in the month of March and began to deteriorate thereafter except Co. 997 which attained the peak in the month of May with 19.04 per cent sucrose. Co. 740 recorded the maximum C.C.S. of 6.49 tons per acre in the month of March. In respect of jaggery recovery the month of February was found to be the best for good recoveries.

In the maturity observation plots of late varieties general deterioration in juice quality was noticed in all the varieties beyond March except Co. 1022 where the juice quality was in the trend of improvement. The juice quality in Co. 1044 was also good. The jaggery recovery was also noticed to be good upto the month of March. Juice quality and jaggery recovery was poor in the month of May and June.

In the study on the response of sugarcane crop to phosphatic manuring, marked variation either in yield, juice quality jaggery recovery or jaggery quality could not be noticed. However among the plots manured with phosphates plots manured with 75 lb. P2 O5 all at planting by normal method of application, gave the maximum yield of 50.2 tons per acre. In general all the plots yielded over 40 lb. of millable cane per acre. The application of 150 lb. P2 O5 half at planting and half at earthing up gave better juice quality.

In the special season trial of sugarcane Co. 419, and Co. 449 planted in the months of August, September and October and harvested at the age of 11 to 15 months, it was noticed that Co. 449 recorded better juice quality than Co. 419 in all the 3 months of planting. There was also improvement in juice quality from 11 to 15 months both in Co. 419 and Co. 449. This is the first year of trial and the trial is being continued to confirm the results.

In the bulk observation plots planted with Co. 419 and Co. 449 to study the yield trend of the two standard varieties, the yield data revealed that Co. 419 recorded an average yield of 37.10 tons and Co. 449—30.96 tons of cane per acre respectively.

*Work done under the 'scheme for the improvement of gur manufacture and storage' 1959-60.*—Jaggery samples were prepared from the eight varieties, viz., Co. 419 and Co. 449, Co. 658, Co. 726, Co. 740, Co. 785, Co. 997, and Co. 1001 harvested at different ages, and the samples were analysed for physical properties and chemical constituents. Juice analysis prior to boiling was also conducted. From the results of analysis it is observed that almost all the varieties attain maturity in 12-13 months. Co. 726 is found to yield gur of inferior quality compared to others. Gur samples have also been prepared from juices of Co. 419 and Co. 449 mixed in different proportions. Gur samples prepared from pure Co. 449 is found to be better than that prepared from pure Co. 419 and mixed variety.

*Deola extract and Colocassia extract combined with lime* were tried as clarificants on Co. 449 and Co. 419 juices. Deola extract combined with lime was found to impart good colour and consistency to gur prepared from Co. 449 though there is not much variation in chemical constituents.

Jaggery samples prepared in January, March and May were stored in six different receptacles namely Airtight drum, Alakathene bag, mud pot, mudpot smeared with cowdung, on the exterior furnace ash and in the open of a small scale under village conditions. Airtight drum and Alakathene bag were found to preserve gur without deterioration in quality. Consequent on the introduction of large scale storage studies, the small scale storage trial was discontinued.

About 10 tons of gur in the shape, of balls were purchased at Gudiyatham tract and stored in two different treatments both under ordinary and scientific godown conditions. The first round of analysis prior to storage was completed.

*Miscellaneous.*—In the bulk trial conducted with Co. 419 to study the effect of chemicals on the control of termites, heptachlor was found to be effective in the control of termites. Similarly, Gamma BHC(EC) was found to be effective on the control of early shoot borer on sugarcane.

Co. 419 and Co. 449 were planted in 50 cents plots to judge their yielding capacity under normal conditions of manuring and cultural operations. Co. 419 yielded 37.10 tons and Co. 449—30.96 tons per acre.

*Paddy.*—Paddy was the main crop grown in rotation with sugarcane in this station, over a total area of 4.60 acres this year; distributed as 1.90 acres under early samba. 1.50 acres under late

samba and 1.20 acres under kar. Seeds crops of GEB 24, Culture 6538, BAM3 and MTU 19 for samba season and TKM 6 for Nava-rai and kar seasons were raised. A total quantity of 26,279 lb. of paddy seeds were distributed from the station to the district staff.

*Green manure.*—Sunnhemp, Gliricida, Pillepesara and Sesbania were raised as green manure crop. A total of 1,315 lb. of Sunnhemp, 155 lb. of Gliricidia and 20 lb. of Pillepesara were obtained for distribution to the district staff.

*Banana.*—Banana was raised in an area of 0.25 acres. The local mauritius was the variety grown.

*Orchard.*—Eighty-three malta lemon layers, 12 citrus budded hawaii layers, 12 mango grafts were distributed to the ryots.

*Vegetables.*—Tomato and bendai and Tomatillo were planted in an area of 0.25 acres. Six oz. of bendai 10½ oz. of tomato and 6½ oz. tomatillo seeds were collected and distributed.

*Fodder grasses.*—One lakh eighty-five thousands slips of guinea grass were supplied for planting.

*Seeds distributed during the year from 1st July 1959 to 30th June 1960.*

| <i>Paddy.</i> |    |    |    | <i>Sugarcane.</i> |         |       |
|---------------|----|----|----|-------------------|---------|-------|
|               |    |    |    | LBS.              |         | TONS. |
| G.E.B. 24     | .. | .. | .. | 8,970             | Co. 419 | 27    |
| Culture 6,538 | .. | .. | .. | 7,500             | Co. 449 | 9½    |
| B.A.M. 3      | .. | .. | .. | 3,288             |         |       |
| T.K.M. 6      | .. | .. | .. | 3,520             |         |       |
| A.S.D. 5      | .. | .. | .. | 2,001             | Co. 740 | 2     |

*Sugarcane Research sub-station, Kulitalai.*

*Season and rainfall.*—There was a total rainfall of 788.50 m.m. on 57 rainy days, against a total rainfall of 467.26 m.m. on 53 rainy days, during the previous year 1958-59.

Heavy rain was experienced during the earlier part of the north-west monsoon as a result of which the crop was inundated with flood waters for the periods ranging from 3 to 21 days on several occasions. This has caused reduction in stand and poor growth in sugarcane. Apart from the damage caused by floods the seasonal conditions during the year were favourable for the growth of cane. There was no difficulty for irrigation throughout the year inspite of the closure of the main supply channel for a month in June 1960 and the crop has withstood this period very well due to the heavy clay soil of the tract.

*Research—(a) Agronomy—(1) 1958-59 special season—main yield trial.*—In this trial, six varieties Co. 467, Co. 658, Co. 740, Co. 758, Co. 785 and Co. 1001 were under study along with standards and Co. 419 and Co. 449. This was the first year of the trial

during the special season. The canes were harvested during September 1959. The Co. 1001 has recorded the maximum yield of 35.27 tons whilst Co. 419 has recorded the minimum yield of 24.31 tons. Co. 658 has recorded the highest juice quality with 13.34 per cent C.C.S. followed by the standards Co. 419, Co. 449 and Co. 1001 with 13.00 per cent C.C.S., Co. 1001 and Co. 658 are found to be more promising varieties than the others.

(2) 1959-60 *Special season—main yield trial.*—This is the second year of the trial during the special season with the same six varieties Co. 467, Co. 658, Co. 740, Co. 758, Co. 785 and Co. 1001 and the standard Co. 419 and Co. 449. The crop is nine months old. The varieties Co. 1001, Co. 467, Co. 758 exhibited good tillering and vigorous growth. The trial is in progress.

(3) 1959-60 *Main season—main yield trial.*—This is the second year of the trial. The varieties which were under study are Co. 467, Co. 658, Co. 740, Co. 758, Co. 1001 and the two standards Co. 419 and Co. 449. The standard growth of the crop in this trial was considerably reduced due to frequent floods from middle of July 1959 to November 1959. This caused profuse rooting at the nodes and sprouting of buds due to water stagnation. Arrowing was observed in all varieties in October-November 1959 and it was very profuse in Co. 758. The standard variety Co. 449 has recorded the highest juice quality with 13.46 per cent C.C.S. followed by Co. 658 with 13.31 per cent C.C.S. and Co. 1001 with 13.06 per cent C.C.S. The trial was harvested during March 1960. The variety Co. 467 has recorded the maximum yield of 22.17 tons per acre and Co. 467 has recorded the maximum yield of 22.17 tons per acre and Co. 658 the minimum of 9.66 tons per acre. In general the yield is poor in all varieties though the results were statistically significant.

(4) *Main season 1960-61—Main yield trial.*—This is the third year of the trial with the varieties Co. 467, Co. 658, Co. 740, Co. 758, Co. 785 and Co. 1001 and the standards Co. 419 and Co. 449. The variety Co. 467 has recorded the maximum germination of 63.93 per cent followed by Co. 758 with 55.93 per cent. The standards Co. 419 and Co. 449 have recorded a germination of 53.24 per cent and 44.06 per cent respectively. Uniform stand and vigorous growth was observed in the variety Co. 758 followed by Co. 658. The trial is in progress.

(5) 1959-60 *Main season—Varietal study plots.*—Forty new Coimbatore varieties released by the Sugarcane Breeding Institute, Coimbatore, during 1957-58 were under study, in single series observation plots along with the standards Co. 419 and Co. 449 with the object of selecting the varieties suited for early, mid and late seasons crushing under normal conditions of manuring and irrigation in the Kulitalai tract. The germination was less than

40 per cent in all varieties. The standards Co. 419 and Co. 449 have recorded 42 per cent and 43 per cent respectively. The germination was very poor in Co. 1180, Co. 1215, Co. 1216 and Co. 1220 which have recorded over 4 tillers per germinated bud. The stand and growth was much reduced due to the frequent floods that occurred during July-August 1959. Arrowing was observed in Co. 1173, Co. 1175, Co. 1176, Co. 1178, Co. 1179, Co. 1189, Co. 1191, Co. 1197, Co. 1201, Co. 1204, Co. 1210, Co. 1212, Co. 1216, Co. 1218, Co. 1219 and Co. 1229 in October-November 1959. The crop was harvested during May 1960. In general, yields were very poor due to flood damage. However, the varieties Co. 1175, Co. 1176, Co. 1218, Co. 1219, have recorded a calculated average yield of above 25 tons per acre. The standards Co. 419 recorded above 27 tons per acre. The varieties Co. 1176, Co. 1178, Co. 1193, Co. 1200, Co. 1210, Co. 1211, Co. 1216, Co. 1217, Co. 1224, and Co. 1227 have recorded better juice quality with above 13 per cent C.C.S. though not superior to the standard Co. 449 which has recorded above 14 per cent C.C.S. As the yield data and juice analysis have been highly vitiated due to floods damage, selection of varieties for the next stage of trials and classification of varieties into early, mid and late was not attempted during the year.

(6) 1960-61 Main season—Varietal study plots.—The trial is in progress with the 58 new Coimbatore varieties 1957-59 release (Co. 711 to Co. 1255 series). The percentage of germination ranges from 21.78 per cent in Co. 1221 to 71.78 per cent in Co. 1224. The varieties Co. 726, Co. 810, Co. 997, Co. 1175, Co. 1184, Co. 1187, Co. 1189, Co. 1205, Co. 1206, Co. 1210, Co. 1211, Co. 1218, Co. 1223, Co. 1224, Co. 1227, Co. 1232, Co. 1239, Co. 1247, Co. 1251 and Co. 1255, have recorded more than 50 per cent germination. The varieties Co. 1221 and Co. 1173 have recorded poor germination. Tillering is in progress. Vigorous growth and uniform stand was observed in Co. 1223, Co. 1224, Co. 1226, Co. 1189, Co. 1239 and Co. 1193; The trial is in progress.

(b) Chemistry.—Observation trial with Nitrophoska fertiliser 1960-61 main season.—The trial planted with the variety Co. 419 in single series observation plots with the following three treatments:—

(i) 250 lb. N per acre as ammonium sulphate alone (control).

(ii) 250 lb. N per acre as ammonium sulphate + 250 lb. P<sub>2</sub>O<sub>5</sub> as super.

(iii) (250 lb. N + 250 lb. P<sub>2</sub>O<sub>5</sub>) as Nitrophoska green is in progress. The germination in all the three treatments is above 55 per cent. Vigorous growth and good stand of crop is noticed in the treatment II followed by treatment I. Further observations are in progress.

(c) Entomology.—The sugarcane borers continued to be the most important pests on sugarcane during this year. Among the minor pests like pyrilla, white-fly, mealy bugs, scales, mealy wings, white-fly was conspicuously present on all the varieties under water-logged conditions which was a constant feature during the year. Cane fly was found in large numbers during the cooler months.

Studies on borers.—(1) Early shoot borer (*Chilo traea infuscatellus*) and

(h) Top borer (*Scirpophaga nivella*).

General observations on the incidence of early shoot borer, top borer and internode borers were recorded in the Agronomy trials and other agronomically important varieties. Early shoot borers counts were recorded at an interval of 21 days up to 3 months after planting and top borer up to sixth month and at the time of harvest. A general increase in early shoot borer was observed from April to June in almost all varieties which indicates that summer conditions are more favourable for the pest attack. The average infestation ranged from 1.3 per cent in Co. 1205 to 31.2 per cent in Co. 1199 (1959-60 main season varietal study plot). In the main yield trial (1959-60 main season) Co. 785 has recorded the maximum attack of 13.1 per cent and Co. 740 the minimum of 1.4 per cent.

Top borer incidence ranged from Nil in Co. 1231 to 15.5 per cent in Co. 1193. From the observations made during the season no definite varietal resistance or preference to the borers could be made out. In the special season (1959-60) trials, the top borer incidence ranged from Nil in Co. 419 to 13.31 per cent in Co. 785.

2. Chemical control of borers—(a) Insecticidal trial for the control of early shoot borer (1959-60 main season).—The experiment was laid out during 1959-60 main season with the varieties Co. 419 and Co. 449 in duplicate observation plots. The chemicals tried were D.D.T 50 per cent W.P., B.H.C. 50 per cent W.P., Gamma B.H.C. 20 per cent E.C., Endrin, Folidol, Ryania 95 per cent W.P., and Toxaphene. Three rounds of spraying were given at intervals of 21 days. The chemical Toxaphene 25 per cent E.C. is found more promising than the other treatments. Due to floods the final spraying could not be taken up.

(b) Another trial was conducted during 1959-60 main season with Gamma B.H.C. 20 per cent E.C., with varying concentrations for the control of early shoot borer. The concentrations were (i) 2.5 lb. per acre; (ii) 3.75 lb. per acre; (iii) 5.00 lb. per acre; (iv) Control. The insecticide of the required concentration was applied to the furrows with rose can in each plot at the rate of 120 gallons of liquid per acre at the time of planting. The results indicate that Gamma B.H.C. 20 per cent E.C., at the rate of 5.00 lb. per acre has reduced the incidence of pests and increased germination thereby to some extent although pronounced difference between treated and control plots are not evident.

(c) 1960-61 main season.—The insecticidal trial which is being repeated for the second year with the chemicals (i) D.D.T. 50 per cent W.P., (ii) B.H.C. 50 per cent W.P., (iii) Endrex, (iv) Ryania 95 per cent W.P., and (v) Folidol. Further observations are in progress.

*Incidence of minor pests.*—Among the minor pests white-fly (*Aleurolobus barodensis*) was observed on all varieties with moderate intensity especially under water-logged conditions. The varieties Co. 1001, Co. 740 and Co. 419 were particularly susceptible to the pests. Cane fly (*Pyrilla* sp) was noticed in a severe form during the cooler months of the year, viz., November to January. Other minor pests like Mealy wings, leaf hoppers, grass hoppers, scales, mites and aphids were recorded in a mild form throughout the year.

(d) *Mycology*—1. *Studies on Smut (Ustilago scitaminea Syd.)*—The 1959-60 main season smut varietal resistance trial was conducted with the varieties Co. 419, Co. 449, Co. 467, Co. 658, Co. 740, Co. 758, Co. 785, Co. 1001, and P.O.J. 3016. Though the trial had to be abandoned before the completion of the growth cycle due to flood damage from the observations made till the time of floods it was seen that the variety Co. 740 was more susceptible to smut (15.42 per cent) followed by Co. 467 (12.24 per cent). The variety Co. 758 did not record the disease.

The incidence of smut under natural conditions were recorded on the various Agronomy trials at the station, at regular intervals to assess the seasonal and varietal factors affecting the incidence of disease if any. In the special season (1958-59) crop, negligible smut infection (less than 1 per cent) was recorded on Co. 419, Co. 740, Co. 758, and Co. 785 while Co. 449, Co. 467, Co. 658, and Co. 1001 were free from infection. In the 1959-60 main season crop, the varieties Co. 1185, Co. 1212, Co. 1217 recorded above 20 per cent infection. Twenty-six varieties did not show any smut attack. The incidence of smut during the 1959-60 main season was noted to be more during the months of September-January which indicates that secondary infection takes place. As the major portion of smut attack is observed only after the sixth month, it is inferred that more smut incidence generally takes place through secondary infection.

2. *Fungicidal trial for the control of sett rot.*—The main object of the trials were to test whether germination could be improved by treating setts with different chemicals.

In the 1959-60 main season the experiment was conducted with the chemicals Agallol, Aretan, Captan, Harvesan, Bordeaux mixture 1 per cent on the varieties Co. 419 and Co. 449. The crop was completely damaged by floods and from the data collected before floods it was observed that Bordeaux mixture 1 per cent

is superior to others in Co. 419 series while there was practically no difference among the treatments, control, Harvesan, Captan and Bordeaux mixture 1 per cent in Co. 449 series. The incidence of pine apple disease (*Ceratomyces paradoxa*) is seen to be very negligible.

In 1959-60 special season trials with the same chemicals, it was observed that though the results were not statistically significant the treatments Captan, Harvesan and Bordeaux mixture 1 per cent have induced better germination of setts than the other treatments.

In 1960-61 main season trials, tried with the chemical Agallol, Aretan, Captan, Harvesan, Bordeaux mixture 1 per cent Phytomycin and Wet Ceresan on the variety Co. 419 it was observed that the treatments Wet Ceresan, Aretan, Harvesan, Captan and Agallol are on a par with control. Therefore none of the treatments were seen to be statistically superior to the control (untreated).

*Incidence of minor diseases.*—3. *Incidence of Mosaic.*—The peak incidence of Mosaic is noticed when the crop is about 5 to 6 months of age. The symptoms were very prominent on Co. 740, Co. 785, Co. 1001, and Co. 449. The varieties Co. 758, Co. 1178, Co. 1180, Co. 1185, Co. 1187, Co. 1193, Co. 1204, Co. 1212, Co. 1215, Co. 1216, Co. 1217, Co. 1219, Co. 1224, Co. 1229, Co. 1230, and Co. 419 are fairly free from Mosaic.

*Top rot.*—Stray incidence of top rot was observed on all varieties throughout the growing season. Red stripes due to *Xanthomonas rubrilineans* were invariably found present on leaves affected by top rot.

*Other minor diseases.*—Other disease symptoms observed were wilting of shoots just after germination in the summer planting which was found associated with the fungus *Rhizoctonia*, drying of shoots in Co. 467, Co. 758, and Co. 785 at the age of 5 months due to the effect of drought, red streaks in the middle portion of lower leaves of the water shoots of all varieties as a result of water stagnation and leaf freckles on Co. 1217, Co. 1206, and Co. 758. Stray leaf spots like ring spot, eye spot and midrib lesions were observed in a sporadic form throughout the year on mature canes.

*Probable economic gain to the cultivators.*—As a result of having taken to improved varieties and cultivation practices in sugarcane cultivation, the gain to the cultivating community is moderately estimated as Rs. 40 lakhs for the year.

#### HORTICULTURE RESEARCH.

1. *Fruits*—(a) *Grape.*—A single vine of Anab-E-Shahi variety produced 644 bunches in two crops in its seventh year of planting thus maintaining its superiority over other varieties in the collection. In a monthly pruning trial with Bangalore Blue variety it was found that cropping can be secured almost throughout the

year by staggered pruning of the vines. The crop output in general was moderate to good except when the vines are pruned in September and October when the yields were low.

(b) *Citrus*.—In the rootstock trial at Kallar, a graft of Wynad mandarin orange on sweet lime came to bearing after about ten years of planting. The fruits were poor in quality. In hybridisation studies three progenies of the combination of Malta lemon (female) Grape fruit (Triumph) (Male) were found to be apogamic in vegetative and fruit characters.

(c) *Banana*.—Fourteen new varieties were described and placed under the relevant groups already formulated. A new variety by name Kalibao introduced from West Bengal and the hybrid between Ney Vannan x Musa balbisiana clone Sawa-i showed more economically desirable characters over the allied local variety 'Peyan' and the mother parent respectively. In perennial bananas, allowing one sucker as follower, a spacing of 9 feet by 9 feet retaining the first produced sucker instead of the first produced sucker after the flowering of the parent plants, etc., tended to increase the yields. The yields did not show any relationship to the depth of planting. While Monthan variety responded better to trench manuring no differences between trench or basin systems were observed in the variety Poovan. Irrigation during summer months improved the yields in Poovan whereas similar treatment in Monthan did not show any response.

(d) *Hill fruits*.—In apple, the Merton rootstocks 778 and 779 continued to maintain their superiority over other rootstocks in regard to vigour, yield and resistance to woolly aphis. Dormant sprays of Sandolin 'A' (0.5 per cent) and Euphyton oil (3 per cent) in shy and late bearing plum varieties confirmed the past finding of earlier and increased yields. In the studies to determine the optimum age of rootstocks for peach, the observations were again in favour of relatively young root stocks as in the past. In Cherimoyer, the seedlings showed better vigour while the grafts accounted for higher yields.

*Jack*.—In the rootstock trial, grafts on Rudrakshi showed indications of precocity. Two hybrids of the combination Singapore Jack\* and Velipala fruited during the year. The fruits resembled the female parent.

*Annonas*.—Nine hybrids in four parental combinations fruited during the year. Bullsheart continued to maintain its superiority as rootstock for custard apple scion.

*Papaya*.—Improvement of types through interceding to evolve superior strains was in progress. A selection from variety Washington is nearing the desired extent of purity for being released as a new strain. Multiplication and large-scale distribution of seeds of Co. 1 papaya was underway.

\* Ordinary Jack and one hybrid of Singapore Jack.

2. *Vegetables*.—Four types in tomato (H. 123, H. 131, H. 138 and H. 204), three in brinjal (S.M. 6, H. 128 and H. 129), two in bhendi (A.E. 8 and A.E. 9) showed promise. Seed multiplication was in progress, with promising selections of gourds and radish.

3. *Tuber crops*—(a) *Potato*.—Buckwheat was found to be a promising green manure to precede the autumn crop of potato. Use of seed tubers of 2 to 2.5 oz. size combined with manuring at 2,750 lb. of Nanjanad mixture was favourable for increased yields in potato. The variety Bencruahcan continued to maintain its superiority in yield over the popular variety Great Scot.

(b) *Sweet potato and tapioca*.—Five exotic sweet potato varieties, viz., V 2, V 6, V 8, V 12 and B. 219 conclusively proved their superiority in yield performance over the local type. Lifting or pruning of the vines did not show any positive influence on yields. Planting the crop early in October and providing it with liberal supply of irrigation water not less than 12 times during the life, crop was found to promote high yields. In tapioca, two varieties, viz., Malavella and Anaikomban were isolated as promising for their high yields.

4. *Species and beverage crops*.—In clove, current season's sucker shoots used as scion recorded better establishment of grafts than terminal shoots. Grafts of cacao were found to be precocious, producing fruits in 33 to 41 months after planting as against 4½ to 6 years taken by seedlings. Semi-hard wood cuttings with four or five leaves treated with Indol butyric acid at 5,000 ppm gave a successful rooting of 10 to 60 per cent in saw dust medium. Training trees to 'fan' shoots was found to be better than training to 'chupon' or leaving the trees unpruned.

5. *Ornamental gardening*.—The investigations into the causes of deterioration in some imported annuals showed that there was no deterioration in *Mimosa*, *Salpiglossis*, *Gypsophylla* for three generations and in *Linum*, *Lineria* and *Candytuft* for two generations after acclimatisation while seeds of *Cineraria*, *Schizanthus*, sweet peas and marigold, deterioration in viability occurred even in their first generation. Description of six imported sweet peas was recorded. Plant introduction studies were in progress. Seeds of *Eucalyptus citriodora*, *Jacaranda* and *Frenela*, gave satisfactory germination up to six months of storage. Rainy weather during flowering was observed to retard blooming in roses. A collection consisting of 30 *Begonias*, 24 *Amaryllis*, 46 *Dabbias* and 32 *Gladioli* was built up.

6. *Other crops including new introductions*.—At Coimbatore, among the different new introductions, white sapota, Meyer lemon and west Indian Cherry made fairly satisfactory progress. The West Indian cherry fruited during the year. The fruits were small, deep crimson in colour, sweet, juicy and possessed a pleasant tart flavour. The Japanese mint gave a good recovery of 2 per cent of oil.

## HORTICULTURE.

**1. Schemes under the Second Five-Year Plan—1. Scheme for Development of Fruit production.**—The programme under the schemes for the year 1959-60 envisaged the grant of long-term loan for planting new orchards at the rate of Rs. 300 per acre to cover an area of 700 acres and short-term loans at Rs. 65 per acre for 5000 acres for rejuvenation of old orchards.

A sum of Rs. 1,56,505 was sanctioned to 384 applicants for long-term loans for establishing new orchards and Rs. 16,100 to applicants for rejuvenation of old orchards. The technical staff also participated in the Village Leaders training camps and visited orchards for rendering advice and assistance in selection of site and layout, planting and improved orchard practices.

**2. Scheme for Training of Gardeners.**—The third course of training of gardeners at the Agricultural College and Research Institute, Coimbatore, for a period of six months was initiated on 2nd November 1959 under the scheme sanctioned in G.O. Ms. No. 1979, Food and Agriculture, dated 29th June 1957, with 37 trainees against 50 provided for. The trainees were given practical training on all aspects of fruit growing, vegetable cultivation and ornamental gardening with special reference to selection of land, propagation, planting and aftercare, irrigation, manuring, cultural and pruning practices, picking, packing, grading, layout of ornamental gardens, maintenance of nurseries, identification of pests and diseases including their prevention and control measures, etc., for a total of 700 hours. The students were given a stipend of Rs. 30 per mensem. On the basis of the practical tests conducted to evaluate their progress, the trainees were awarded the certificate of competency in practical horticulture.

**3. Scheme for conducting Crop Competition in Cashew.**—This scheme sanctioned in G.O. Ms. No. 678, Food and Agriculture, dated 4th March 1957 envisages award of cash prizes to cashew growers in whose holdings the maximum number of cashew plants are established on a per acre basis at the end of one year of planting cashew. Under this scheme which was put into operation during 1957-58 the achievements are as follows:—

|                                   | 1957-58. | 1958-59. | 1959-60 |
|-----------------------------------|----------|----------|---------|
| Number of competitors enrolled .. | 280      | 169      | 29      |
| Areas covered in acre .. .. .     | 344.16   | 265.92   | 81.70   |

**4. Scheme for procurement and distribution of cashew seed-nuts at cost price.**—This scheme was put into operation during 1957-58. During the period under report about 5,360 lb. of seed nuts were reported to have been distributed and these are estimated to have brought newly under cashew, an area of about 1,795 acres.

**5. Scheme for the development of cashewnut cultivation in Madras State.**—A total of 608 parent trees on the basis of yields and desirable tree and nut characters, etc., were selected in six

plantations in the State during the year. A total of 12,800 lb. of seeds was procured from the parent trees for distribution. The staff for the three nurseries at Tindivanam, Pattukkottai, and Paramakudi were posted. A total of Rs. 51,860 was disbursed as long-term loans to 158 cultivators during the year which is estimated to cover 650 acres. The quantity of seed distributed amounted to 1,950 lb.

**6. Scheme for the grant of loans for small-scale fruit preservation units.**—The scheme was sanctioned in G.O. Ms. No. 2958, Food and Agriculture, dated 10th August 1959. A total of 23 applications have been submitted to the Director of Agriculture for sanction of loans. The procedure of sanction and recovery of loans under the scheme awaits approval of the Government.

**7. Scheme for the establishment of an arecanut nursery in Kanyakumari.**—The scheme was initiated in 1957. A total of 4,000 seedlings was raised and distributed during 1959-60 against the target of 5,000 seedlings fixed for distribution annually.

**8. Scheme for intensification of research on mango, citrus, and grapes at the Multi-Crop Fruit Research Station, Periakulam.**—The scheme came into operation in October 1957. The land was acquired in July 1958. Most of the experiments which are of long-range nature were initiated during the year.

**B. Supply of Plants and Seeds.**—Two lakhs eighty-two thousand three hundred and forty-two plants and ninety thousand eight hundred and ninety-nine pounds of seeds were supplied from different stations.

**Scheme for the establishment of Model Orchard-cum-Nurseries in Madras State—(i) Model Orchard-cum-Nursery, Periakulam.**—During the period, 12,727 fruit plants, 4,775 ornamental and other economic plants and 5,650 of other miscellaneous plants were distributed. Co. 1 papaya was coming up satisfactorily.

**(ii) Model Orchard-cum-Nursery, Thimmapuram.**—During the period a total of 12,098 fruit plants, 340 ornamental and other economic plants and 187 other miscellaneous plants were distributed to growers. Cropping in grapes was satisfactory. Sathgudi trees have commenced regular bearing. The progress of other plants in the orchard was satisfactory.

**(iii) Model Orchard-cum-Nursery, Courtallam.**—The centre was inaugurated on 9th February 1960. Preliminary work connected with the establishment of the nursery such as surveying, levelling, felling of trees and clearing of the site was attended to. Steps were initiated for the collection of plant material required for planting the orchard.

**(iv) Model Orchard-cum-Nurseries, Kodaikanal, Thanjavur, Tiruchirappalli and Chingleput—South Arcot.**—The scheme for the establishment of four Model Orchards including the centre at



Courtallam was sanctioned in 1958-59. The work in connection with the selection of sites for the above three Model Orchards was underway.

3. *Government Fruit Farm, Cape Comorin*.—A total of 3,349 fruit plants and 47 of other horticultural plants was distributed during the year. The station became a research centre with the assumption of charge of Sri N. Raghavan as Assistant Horticulturist under the Indian Council of Agriculture Research Scheme for research on stabilising off-season production in mango at this centre.

4. *Vegetable production drive*.—The scheme for the establishment of three vegetable seed production centres at the three model orchards at Periakulam, Thimmapuram and Kodaikanal was sanctioned in G.O. Ms. No. 1393, Food and Agriculture, dated 25th March 1959. At the existing fruit stations, seeds and plants of promising types and varieties of vegetables were multiplied and 4,110 units of vegetable seeds and 6,300 seedlings were distributed. The increase in output as a result of planting these is estimated at about 45 tons.

*Steps taken to disseminate the results of Horticultural Research.*

—1. *Through person and by post*.—A total number of 10,191 enquiries on plant supplies advice on grape culture, vegetable culture and other horticultural crops were received and attended to during the period. In addition, suggestions for layout and establishment of orchards and parks were furnished to parties. The Horticulturist and Associate Professor of Horticulture and his staff also visited 1,694 private orchards, holdings, centres and gardens for rendering advice and assistance on improved practices. This has met in a large measure the need for personal contact with the growers and study of their problems and for transmitting results of research.

2. *Through exhibitions*.—Display of improved plant material and practices formed an integral feature of several exhibitions organized at various cities, towns, villages, fruit stations and centres. Publicity of achievements of the section was made at the First World Agriculture Fair, New Delhi, and through special large-scale exhibitions got up at the All-India Khadi, Swadeshi and Industrial Exhibitions at Madras and Coimbatore, Flower Show at Ootacamund and Fruit Show at Coonoor. The chief events of the year were the Farmers' Day at the Agricultural Research Station, Nanjanad, Kallar and Burliar Fruit Stations and the Central Farm, Coimbatore.

A large number of farmers and fruit growers attended the functions. In addition, seasonal exhibits were sent to 52 exhibitions conducted all over the State and outside. These have helped to foster added interest in the cultivation of horticultural crops.

3. *Through training*.—The conduct of a six months' intensive practical course on all aspects of horticulture such as fruit growing, vegetable cultivation and ornamental gardening to young men under a special scheme for training gardeners has helped the rapid dissemination of results of Research. Besides, special training courses were conducted by the staff on horticultural crops to the trainees under the scheme of refresher course for young farmers at the Agricultural College and Research Institute, Coimbatore, and the farm trainees of the Final B.Sc. (Agriculture) course. These training programmes have helped to carry rapidly the results of research to the growers.

4. *Through publicity and propaganda*.—A total number of 41 scientific and popular articles on results of research was submitted or published during the year. New pictorial posters, ordinary posters, charts and leaflets on horticultural crops were contributed. Posters and placards on horticultural achievements were displayed at the several exhibitions held during the year.

5. *Through distribution of seeds and plants*.—During the period under report, 282,342 plants, 77,744 lb. of potato seed tubers, 13,155 lb. of seeds of vegetables, green manure and other horticultural crops were distributed to the public from the Fruit Stations and Centres. These have been produced from tested plant materials and are adapted to different regions of the State. These are expected to bring at least 1,645 acres under improved plant material. The estimated increased production in terms of yield and monetary value by adoption of improved types and practices are given below:—

| Serial number. | Due to                       | Estimated area in acres. | Increase in production in tons at 2½ tons per acre. | Increase in monetary value at Rs. 100 per ton. |
|----------------|------------------------------|--------------------------|-----------------------------------------------------|------------------------------------------------|
| 1              | Improved types ..            | 1,645                    | 4,113                                               | 411,800                                        |
| 2              | Improved cultural practices. | 7,000                    | 17,500                                              | 1,750,000                                      |
|                | Total ..                     | 8,645                    | 21,613                                              | 2,161,800                                      |

*Economic gain to ryots* —During the year, 282,342 numbers of "Elite" Plant material of fruit trees and vegetables, 77,744 lb. of potato seed tubers, 13,155 lb. of seeds of other horticultural and economic crops were distributed from the various centres. Distribution of vegetable seeds amounted to over 4,110 units. All these are estimated to have covered an area of nearly 1,645 acres under improved Seed and Plant Material. An estimated area of about 7,000 acres is also expected to be covered by adopting improved cultural practices. The additional production of horticultural crops by planting these seeds, etc., is estimated at 21,613 tons, valued at Rs. 21.61 lakhs.



14. AGRICULTURAL RESEARCH STATIONS, *Agricultural Research Station, Aduthurai*.—(1) *Season and rainfall*.—The Mettur Reservoir was opened on 27th June 1959 and water let down for irrigation. Channel water reached the farm on 5th July 1959 and the Kuruvai transplantation was commenced on 9th July 1959. During the year under report there was a total rainfall of only 31.57 inches as against 27.40 inches recorded during the previous year and against a ten-year average of 38.89 inches. Both in south-west monsoon period and north-east monsoon period the rainfall recorded was below normal. However there was enough water-supply from the Mettur Reservoir for the cultivation of paddy crop. Kuruvai and main Samba crops recorded normal yields but the Thaladi crop which was affected to some extent by stem-borer infestation recorded slightly lower yields. There was practically no rainfall during the hot weather period (April and May 1960). The pure crop of sesbania raised in rice fallows as green manure suffered to some extent due to non-receipt of summer showers this year.

(2) *Paddy*—(i) *Seed distribution*.—During the period under report, a total quantity of 116,496 lb. nucleus seeds of improved strains of paddy was distributed from the station to the district staff for growing in State Seed Farm and in Primary Seed Farms.

(ii) *Research*—(a) *Breeding*.—Four cultures in Thiruthurai-poondi Kar and six cultures in Mattaikuruvai were compared for yield against their respective local bulks in the Kuruvai season. Three cultures of Kattuvanam were also compared for yield against ryots bulk in the main Samba season. Culture No. 2172 in Thiruthurai-poondi Kar and Culture No. 2611 in Kattuvanam maintained their superiority once again by giving maximum yield with 13.1 per cent increase and 6.2 per cent increase respectively over their control. In Mattaikuruvai, two cultures, viz., Nos. 3025 and 3028 recorded significantly higher yields than the control with 12.6 per cent and 8.5 per cent increased yield. In the trial of eight short duration Chinese varieties compared for yield against this station strains of similar duration in the Kuruvai season, it was observed that none of the Chinese varieties could outyield the strains ADT. 3 and ADT. 9 which are already popular with the ryots. Eleven cultures isolated from the cross progenies of ADT. 16 x GEB. 24 for the evolution of non-shattering fine riced strains were compared for yield against ADT. 16 in the Kuruvai season; four cultures, viz., Nos. 2030, 2031, 2032 and 2033 recorded significantly higher yields than ADT. 16 with the increase ranging from 29 to 35 per cent. Besides, these cultures were also found to be a week earlier in duration than ADT. 16. These four cultures were retained for further trial and they were sown in the nursery in June 1960. From 219 single-plant selections of Japonica x Indica cross progenies grown and studied, seed material from nine homozygous lots were secured for yield test next season. In addition, 146 desirable single plants were

also selected for further study. From the 36 single-plants of various crop progenies grown and studied for the evolution of dormant short duration strains, seed material from 11 homozygous lots and 133 single plants were gathered for yield trial and further study during next year. From 63 single-plant selections taken from various cross-progenies grown and studied for the evolution of stiff straw strains seed materials from 13 homozygous lots were secured for preliminary yield test. In addition, 100 promising single plants were also selected for further study. Six Cuttack varieties received during the year from Paddy Specialist, Coimbatore, were compared for yield against strains ADT. 9 and ADT. 16 of the station and the four course varieties CR. 1 to 4 were found to be on a par with ADT. 9 in yield while the two fine varieties CR. 5 and 6 were inferior to the Strains ADT. 16.

(b) *Manurial experiments*.—The manurial experiments to determine the comparative efficacies of application of green manure, cattle manure, compost and ammonium sulphate on nitrogen basis alone and in combination with other nutrients like phosphoric acid, potash and lime was repeated during the year in both Kuruvai and Thaladi seasons. In Kuruvai season, application of cattle manure resulted in the highest yield closely followed by green manure. There was no response either for phosphoric acid or potash or lime. In the Thaladi season, application of green manure recorded the highest yield closely followed by ammonium sulphate. Further, during this season there was response for phosphoric acid but there was no response either for potash or for lime. The results were in conformity with those obtained in previous years. To find out the response of different strains to higher doses of manures, the varietal response to manuring experiment commenced during the previous year, was repeated on the same line during the year under report in all the three seasons as in the previous year.

There was no response by any of the strains grown in the experiment to higher dose of manures, namely, 60 lb. N. as ammonium sulphate plus 30 lb.  $K_2O$  as sulphate of potash over a basal dressing of 5,000 lb. of green leaf and 150 lb. of superphosphate per acre. To find out the effect of applying ammonium sulphate in fractional doses instead of in a single dose, an experiment was laid out during the year in all the three seasons and the results showed that there was no difference between the application of ammonium sulphate in a single dose and that applied either in two doses at two different times or in three doses at three different times.

(c) *Cultural trials (Chinese method of paddy cultivation)*.—During the year under report, a new experiment, to compare the Chinese method of paddy cultivation with that of Japanese method and farm method was laid out. The salient features in Chinese method are (i) Digging the field to a depth of 3 feet in layers of 6 inches and removing the soil and keeping the soil

separately and then refilling the soil in layers in the same order after mixing with farmyard manure, (ii) application of very heavy dose of manures (i.e.) 20 tons of farmyard manure, 250 lb. of superphosphate, 83 lb. of sulphate of potash and 500 lb. of ammonium sulphate, per acre. The results showed that there was no increase in yield by adopting the Chinese method of paddy cultivation over that of the ordinary method recommended by the department for adoption by the cultivators, namely, application of 5,000 lb. of green leaf plus 150 lb. of superphosphate and 150 lb. ammonium sulphate. Further, on working out the economies, it was found, that in the case of Chinese method, there was a loss of Rs. 6,397, since for digging alone to a depth of 3 feet an expenditure of Rs. 5,772 per acre had to be incurred.

(d) *Crop weather study*.—The All-India Crop Weather Co-ordinated Scheme to study the relationship between paddy crop and climatic factors was continued and the prescribed meteorological observations as well as observations on growth of crop, panicle emergence, etc., were recorded and data compiled and sent to the Director of Agricultural Meteorology, Poona.

(3) *Green manure crops*.—From the pure crop of sesbania grown in rice fallows and lopping gliricidia plants planted on channel bunds a total quantity of 176 tons of green leaf was obtained and utilized for manuring the paddy fields. From the border crop of sesbania a total quantity of 575 lb. of seed was collected. From the gliricidia plants grown along the roads 221 lb. of seeds were collected. This station has attained self-sufficiency in green manure requirements.

(4) *Pulses*.—The work on evolution of high yielding strains by selection in wet land blackgram and greengram was continued during the year. Four cultures in blackgram and nine cultures in greengram were compared for yield against their local bulk respectively.

Three cultures in blackgram and five cultures in greengram that gave high yields were carried forward for further trial. In addition 5.86 acres were grown with local variety of blackgram as catch crop in rice fallows and a total quantity of 1,679 lb. of grain was obtained. This worked out to 286 lb. per acre on an average.

(5) *Fruits*.—A total number of 678 fruit plants comprising of acid lime seedlings, malta lemon rooted cuttings, citron hawaii seedlings, pummello seedlings, Singapore jack seedlings and mango grafts were sold to ryots. A total quantity of 5,133 lb. fruits consisting of mainly mangoes, malta lemons and pummello was harvested and sold to the public.

(6) *Coconuts*.—From 131 coconut trees that were in bearing 5,917 nuts harvested and sold. One hundred and ninety-seven coconut seedlings were also raised in nurseries in the rest-house compound and sold to public.

(7) *Livestock—Cattle*.—From five Scindhi cows that were in milk a total quantity of 8,502 lb. of milk was obtained and disposed off. The Scindhi breeding bull maintained at the station performed a total number of 56 services during the period under report. Nine pairs of work animals were maintained on the station.

(8) *Apiculture*.—Eight bee colonies were maintained on the station and a total quantity of 34½ lb. of honey extracted.

(9) *Miscellaneous*—(a) *Vanamahotsava*.—During the first week of July 1959, Vanamahotsava was celebrated at this station. His Excellency the Governor of Madras who visited the station during that week inaugurated the celebration by planting a coconut seedling. Fruit plants and seedlings of other trees were also supplied to the Collector of Thanjavur for planting in Collector's office compound during the Vanamahotsava Week.

(b) *Inauguration of Intensive Agricultural District Programme (Package Deal) in Thanjavur district*.—On 13th April 1960, the Tamil New Year's Day, the Intensive Agricultural District Programme to be carried out in Thanjavur district was inaugurated at this station by the Chief Minister of Madras State when the Home and Agricultural Minister presided. Mr. Thomas W. Simon, the American Consul-General, also took part, in the function.

(c) *Visitors*.—His Excellency the Governor of Madras visited the station on 7th July 1959. The Chief Minister, Home Minister, American Consul-General and number of important officials of Government of India and from other States also visited the station. A large number of mirasdars, nearly 2,000 who attended the inauguration of Package Deal were taken round the farm and the exhibition specially arranged on that occasion at this station and everything explained in detail.

*Rice between Station, Tirukuppam (Chingleput district).*

1. *Season*.—The south-west monsoon was slightly above normal. The early heavy showers were helpful to standing Sornavari crops and facilitated timely preparation of the rainfed areas. But they interfered with harvest of gingelly, cotton and chillies. The showers in July-August caused lodging of Sornavari crops in ears, but facilitated rainfed sowings. The north-east monsoon which set in by the last week of September though above normal withdrew by 1st week of December till last week of January. The showers in November-December interfered with the early Samba harvest. There was no flow of water in the spring channel, though water level in wells rose up to some extent. The cropped area was maintained only with lift irrigation, with some difficulty in the later half both in Samba and Navarai seasons. Practically there was dry spell in the hot weather excepting light showers on a minute

day, that was below normal. Even though the overall precipitation was above normal, yet on the main season (Samba and Navarai) there was inadequate precipitation and the standing crops were maintained with lift irrigation, the electric motors being worked day and night.

**2. Paddy improvement work—Pureline selection.**—Five Sornavari cultures were again under yield trial against TKM. 3 Chingleput districts and Culture 1886 has recorded 3.1 per cent increased yield over TKM. 3 and Culture 8876 has recorded increased yield over TKM. 3 standard ranging from 3.6 per cent to 30.4 per cent in the North Arcot district. In the Samba seasons, four cultures in Vadan Samba, two cultures in Chinna Samba, three cultures in Kappakar were under yield trial. In case of Vadan Samba cultures, the treatment differences were statistically significant and the Cultures 10506 and 10476 were found to have yielded 35.9 per cent and 16.6 per cent increased yield over the standard ADT. 22 under semi-dry condition. Under Chinna Samba (wet) the treatment differences were not statistically significant and none of the cultures outyielded the standard Co. 5. In case of Kappakar cultures (wet) the treatment differences were not statistically significant. But the trend in yield was that Culture 7634 and 7767 gave increased yield over the standard Kappakar, 11 per cent and 8 per cent respectively. Besides 16 Kappa Samba cultures were under yield trial under semi-dry condition in Samba season against Kappa Samba standard in two series. But the treatment differences were not statistically significant. In series I the trend was that the culture 1389 gave 10.3 per cent more yield than the standard, whereas in series II Cultures 1397, 1442 and 1446 gave 19.4 per cent 3.0 per cent and 1.5 per cent more yield than the standard. In the Navarai season eight cultures under Mottakar and two under Kesari were under trial. The treatment differences were not statistically significant in Mottakar cultures, but the trend being that all the cultures have outyielded the standard, varying from 27.6 per cent (10201) to 44.9 per cent (7399). In case Kesari cultures also the treatment differences were not statistically significant but the two cultures have yielded more than the standard by 25.7 per cent (No. 10430/6) and 40.4 per cent (No. 10435). The Culture 10435 has been sent for district trial and the results are awaited.

**(a) Introduction.**—Eleven short duration types were under yield trial against TKM. 3 (standard) in Sornavari (1959–60) season in two series and the treatment differences were found to be statistically significant and PTB. 10, ADT. 20, ADT. 3, and TKM. 6 were found to have yielded 26.6 per cent, 21.2 per cent, 7.9 per cent and 5.5 per cent more than the standard TKM 3 in series (b), in series (a) ADT. 15, T. 2128/1, T. 1029, T. 1023, T. 978 have

yielded 27.0 per cent, 13.2 per cent, 9.9 per cent, 8.2 per cent and 7.7 per cent respectively more than the control TKM. 3. The trial has been repeated in Sornavari (1960–61) and the crop is on the field. Of the four Chinese types under yield trial against Co. 13 and TKM. 3 in 1959–60 Sornavari, the treatment differences were statistically significant and only two cultures were carried forward for trial further and the same trial is repeated with two cultures both under normal and heavy manuring conditions and the crop is on the field. CH. 62 has been reported to have yielded more than TKM. 3 by 1.3 to 7.3 per cent in the districts.

**(b) Hybridization.**—Ten cultures of season and period bound crosses (GEB. 24 × Co. 10) were under yield trial (1959–60) in Sornavari season and the treatment differences were statistically significant and all cultures have outyielded the standard TKM. 3. The trial has been repeated in the current Sornavari (1960–61) season both under normal and heavy manuring condition and the crop is on the field. The Cultures 6803 and 6810 that were sent for trial in the districts have been reported to have recorded increased yields of 19.6 to 22.5 per cent, 22.2 to 25 per cent over TKM. 6 standard respectively in Kancheepuram and Saidapet taluks in Chingleput district. The Culture 4761 (C. 4 X Vadan Samba) was under yield trial against ADT. 22 standard under semi-dry condition in 1959–60 Samba season. The treatment differences were not statistically significant. But the trend revealed that the Culture 4761 has given 15.6 per cent increased yield over ADT. 22 standard. The Culture 4761 was sent for trial in the districts and it was reported to have yielded 3.1 per cent increased yield over A.D.T. 22 standard. One hundred and three F. 5 Progenies of ASD. 5 X TKM. 3 were planted in Preliminary yield trial against TKM. 3 and TKM. 6. Only six progenies recorded higher yield than the standards. Forty-one progenies that were promising and pure for height, duration and non-lodging characters have been planted under yield trial in six series repeated four times against TKM. 3 and TKM. 6 under current Sornavari (1960–61) both under normal and heavy manuring conditions and the crop is on the field. From the segregating lots, 96 progenies have again been put under observation against TKM. 3 and TKM. 6 and the crop is on the field. Twenty-seven single plants of progenies of Japonica × Indica were in observation plots against GEB. 24 in the Samba season (1959–60). Of these, three pure progenies have been carried forward for yield trial next year. And from two segregating lots single plants have been taken with desirable characters and the observation trial will be repeated next year. One hundred and thirty-two single plants of the progenies of Japonica × Indica were tried in observation plots and 45 progenies have been carried forward for CYT next year, besides taking single plants from the segregating lots that will be put under observation trial next year. Two Cultures 1473 and 1479 against TKM. 6 standard

have been put under yield trial in the Samba season and the treatment differences were not statistically significant. The trend in yield was that Cultures 1479 and 1473 gave increased yield over TKM. 6 by 17.8 per cent and 3.6 per cent respectively. Thirteen blast resistant progenies of Co. 26 x Co. 19 were under yield trial along with Co. 19 and Co. 25 standards in Samba (1959-60) season in two series. The treatment differences were not statistically significant but the trend was that excepting No. 175 all the rest (five progenies) have given increased yield over Co. 19 ranging from 2.9 per cent to 11.7 per cent in series (a) and in series (b) but for the progeny No. 208 the rest (six numbers) have yielded more than Co. 19 by 18.0 per cent to 24.9 per cent. The trial will be continued. Seventy-two single plants selected from the progenies of Co. 1 X Burma types were put under observation against Co. 18 for study of purity and non-lodging characters, in the Navarai season 1959-60. Of these, 45 progenies will be carried forward for yield trial next year and single plants were taken from segregating lots of study under observation next year.

(c) *Manurial, cultural and miscellaneous trials*—The trial with phosphatic manures.—With a view to compare the efficiency of hyper phosphate and dicalcium phosphate with that of super, was laid out in 1959-60 Samba season with 39 treatments repeated four times. The data were sent to Coimbatore for statistical analysis and the results are awaited.

The trial of varietal response to manuring was laid out during Samba season with six varieties GEB. 24, Co. 5, Co. 19, Co. 25, ADT. 22, and ASD. 5 with the ten manurial treatments repeated four times. The data were sent to Coimbatore for statistical analysis and the results are awaited.

To find out the effect of fractional application of ammonium sulphate on the yield of paddy with special reference to the application of the fertilizer a week before flowering the trial was repeated in 1959-60 Samba and Navarai with five treatments repeated six times with the variety Co. 25 and TKM. 6 respectively. In the Samba season the treatment differences were not statistically significant both for grain and straw. The trend however was that in grain yield the crop under Tr. 2 (30 lb. N as ammonium sulphate 1/2 at planting the balance a week prior to flowering) has given 3.3 per cent more yield than control followed by Tr. 1 (30 lb. N. as ammonium sulphate 1/3 at planting, 1/3 one month after planting, 1/3 two months after planting) being 2.6 per cent more. In case of straw Tr. 4 alone has given 2.9 per cent more yield than the control. In Navarai also the treatment differences were not statistically significant both for straw and grain. However the trend in case of grain and straw yield was that none yielded more than control.

In order to verify whether the Chinese method of paddy cultivation will give phenomenal yield as claimed by the Chinese an experiment was laid out with the following three treatments repeated six times with the long duration strain Co. 25 in the Samba season :—

*Treatment 1.*—Chinese method of paddy cultivation.

*Treatment 2.*—Japanese method of paddy cultivation.

*Treatment 3.*—Local method of cultivation adopted by the Department. The results are as under :—

| Number and treatment. |                              | Acre yield of grain in lb. | Acre yield of straw in lb. | Cost of cultivation per acre. | Profit or loss per acre. |
|-----------------------|------------------------------|----------------------------|----------------------------|-------------------------------|--------------------------|
| (1)                   |                              | (2)                        | (3)                        | (4)                           | (5)                      |
| 1                     | Local method (control) .. .. | 3,717                      | 5,929                      | 457.8                         | 270.55                   |
| 2                     | Chinese method .. ..         | 3,358                      | 7,921                      | 3,957.0                       | 3,273.65 (loss)          |
| 3                     | Japanese method .. ..        | 2,939                      | 5,572                      | 661.0                         | 76.26 (loss)             |

With regard to the grain yield the crop under local improved method has given the maximum yield whereas the Chinese method has given 90.3 per cent and Japanese method 79.1 per cent than control.

In case of straw the Chinese method has yielded the maximum followed by local and Japanese method.

Under these circumstances the improved technique suggested under Chinese method of paddy cultivation has not yielded more than the control, in grain though the straw yield was 33.6 per cent more than the control. Further, digging up of soil up to 3 feet depth as suggested under this improved technique is not only not feasible but too costly to be advocated to ryots to follow.

To find out the effect of intercultivation by Rotary weeder and hand racks as practised in the Japanese method of cultivation on the yield of paddy under normal and heavy manuring conditions the experiment was laid out for the third year in (1959-60) Samba season with ten treatments repeated four times. The treatment differences were not statistically significant. In grain yield however the trend was that all the treatments gave increased yield over control ranging from 0.9 per cent to 12.1 per cent. In case of straw none exceeded the control in the output and the treatment differences were statistically significant.

To determine the optimum seed rate for the broadcast crop of paddy and to find out whether the rate of 60 lb. per acre recommended now can be reduced further in view of the fact that lesser seed rate is advocated as per Japanese method the experiment was laid out in Samba season under semi-dry condition with 24 treatments repeated four times for the second year. The treatment differences were not statistically significant. The trend was that there was no appreciable difference between using soaked and unsoaked seeds and sowing seeds broadcast gave the lowest yield. Sowing behind country plough was found to be better than the rest. The trial will be repeated.

3. *Other crops*.—Crops of Co. 3 Ragi, AKP 2 Ragi and TMV 2 Groundnut were grown and acre yields of 1,083 lb., 800 lb. and 926 lb. respectively were obtained. MCU. 2 cotton and P. 216 F. cotton were raised and an acre-yield of 97 lb. and 1,010 lb. were obtained respectively. Short duration variety of tapioca has yielded 3,980 lb. of tubers per acre while long duration variety has given 9,673 lb. per acre. Besides, green manure crops of sunn-hemp, daincha and sesbania were grown and a total quantity of 1,017 lb., seeds have been extracted. Fruit plants like lemons, citron, hawaii, sathgudi, acid limes, papaya, mangoes, sapotas and cashews were maintained and green leaf yielding shrubs of Gliricidia, Pungam, Vagai and Kapok were also raised. A total quantity of 2,154 lb. of fruits, 1,047 lb. of green manure seeds and 189 lb. of vegetable seeds have been harvested during the period under report.

4. *Seed distribution*.—

|                                  |             |
|----------------------------------|-------------|
| 1 Paddy seeds .. .. .            | 44,870 lb.  |
| 2 Ragi seeds .. .. .             | 1,551 "     |
| 3 Varagu .. .. .                 | 179 "       |
| 4 Vegetable seeds .. .. .        | 277 "       |
| 5 Gingelly .. .. .               | 320 "       |
| 6 Groundnut pods .. .. .         | 444 "       |
| 7 Blackgram .. .. .              | 400 "       |
| 8 Castor .. .. .                 | 30 "        |
| 9 Seedlings and cuttings .. .. . | 27,845 Nos. |
| 10 Paddy seedlings .. .. .       | 81 cents.   |

5. *Visitors*.—A total number of 920 persons inclusive of officials visited the Station during the period under report. The Dean and Additional Director of Agriculture, Coimbatore, the Director of Agriculture, Madras, the State Horticulturist, the Deputy Director of Agriculture, Madras, the Paddy Specialist, Coimbatore, and other Research Officers from the Agricultural College and Research Institute were among the Official visitors. Among the other distinguished visitors were probationary Deputy Collector, Saidapet Assistant Collector, Sri Subbiah, I.A.S., Kumari Anjani Devi, I.A.S., Thailand Engineers, Eleven American Farmers, Food and Agricultural Organization, Fellow from East Africa, Chief Inspector of Basic Education, West Bengal, Chief Inspector of Secondary Education, West Bengal, and Member of Board of Revenue, Madras.

I. *Progress of work and results achieved*.—44,870 lb. of paddy seeds, 3,229 lb. vegetable and other seeds, 27,845 numbers of cuttings and seedlings were distributed from the Station. Seeds of TKM. 1 to 6 and suitable strains of other stations were distributed to districts.

*Results achieved during 1959-60*.—Two cultures in Vadan Samba, sixteen in Kappa Samba, two in Chinna Samba, three in Kappakar, eight in Mottakar, two in Kesari were found promising in comparative yield trials and were carried forward for further study. Two Chinese types, four short duration types in Sornavari,

three types in Navarai were found to be promising. Two Sornavari cultures were also found to be promising.

Forty-eight progenies of Indica×Japonica have been carried forward for further study under yield. Forty-five progenies of Co. 10 × Burma type were carried forward for further study.

Under varietal response to manuring Co. 5 was found to be superior to the rest followed by Co. 19, which was on a part with Co. 25, GEB. 24, was the poorest yielder. It was found that while the application of nitrogen was distinctly advantages, there was no advantage in applying more than 30 lb. N. per acre. Potash was found to have no effect in yield. There was no differential response of varieties to the manures. In the seed rate experiment in broadcast crop of paddy, there was no appreciable difference in using soaked or unsoaked seed. Sowing seeds broadcast has given lower yields.

The improved technique suggested under Chinese method of paddy cultivation was found to be not only not superior to the local improved method but also not economical.

*Central Banana Research Station, Aduthurai.*

*Research*.—Fourteen new varieties were described and based on the characters recorded, they were classified under the eight groups formulated already. At the end of the period the total number of varieties including synonyms, maintained at the Station was 206. Organoleptic tests were conducted on 40 banana varieties to assess the quality of the fruits. A total of 116 inflorescences in all the commercially important varieties were crossed with the available male parent. Seed-set was noticed in 16 combinations. Four hybrid progenies which came to flowering during the period was described, of which one hybrid, viz., Ney Vannan × Musa balbisiana clone Sawai showed some indications of potentially economic characters over the mother parent. Selections were made in the varieties Monthan and Rasthalai for high grade of bunch and a mutant in Rasthalai, with pink pseudostem was spotted out. The results of the desuckering trial in perennial area indicated that allowing one sucker as follower is superior to allowing more than one sucker, for obtaining higher yields. The results of the cultural trial in perennial area with the variety Poovan showed that the spacing 9' × 9' was significantly superior in recording higher yield than 10' × 10' spacing. Between the two systems of desuckering adopted, allowing the first produced sucker seems to be better for securing higher yields than allowing the first sucker produced after parent plant has flowered. The capacity to yield heavier crops has no relationship with the depth of planting. The observational trial on the method of application of manures in trenches in between alleys as against the application in basins around the pseudostem showed that the variety Monthan responded better for

trench manuring while the variety Poovan did not show any differential response. Trial on irrigation in perennial area showed that the variety Poovan under irrigation recorded higher yield while there was no positive response in the case of the variety Monthan for irrigation. Root studies were conducted in six plants of Monthan, Poovan and Rasthali varieties and fruit development studies were taken up in five varieties. The suckering habits of 14 varieties were studied.

*Steps taken for dissemination of results of horticultural research.*  
(Crop : Banana).

1. *Through person and Post.*—A total of 207 enquiries on various aspects of banana culture from public were attended to. The Banana Research Officer and his staff visited over 100 private plantations and rendered necessary advice.

2. *Through exhibitions.*—Display of improved varieties and demonstration of improved practices were done during exhibitions. Exhibits and attractive posters showing results of achievement at the Central Banana Research Station, Aduthurai, were sent to six exhibitions in various parts of the country including the World Agricultural Fair at New Delhi.

3. *Through training.*—This does not arise since nobody was deputed for training at this station.

4. *Through publicity and Propaganda.*—Scientific and popular articles and fortnightly excerpts bearing the results of the research at the Central Banana Research Station, Aduthurai, numbering 10 in all were sent for publication.

5. *Through distribution of seeds and plants.*—A total of 12,687 suckers in choice banana varieties were supplied to the ryots. This is expected to cover an area of about 19 acres at the first instant. The estimated increased production in terms of field and monetary value are given below :—

ECONOMIC RESULTS OF HORTICULTURAL RESEARCH DUE TO  
IMPROVED TYPES AND PRACTICES IN MADRAS STATE (1959-60).

(Crop : Banana.)

*Estimated increased production in terms of yield and monetary value.*

| Due to                            | Area covered in acres. | Increased production in tons at 2½ tons per acre (tons). | Increase in monetary value at Rs. 100 per ton. |
|-----------------------------------|------------------------|----------------------------------------------------------|------------------------------------------------|
| (1)                               | (2)                    | (3)                                                      | (4)                                            |
| Improved types .. .. .            | 19                     | 47.5                                                     | 4,750                                          |
| Improved horticultural practices. | 7,000                  | 17,500                                                   | 17,50,000                                      |
| Total ..                          | 7,019                  | 17,547.5                                                 | 17,54,750                                      |

*Agricultural Research Station, Pattukkottai.*

*Season.*—The year 1959-60 recorded 42.68 inches of rain in 61 rainy days as against 36.06 inches in 49 rainy days in 1958-59 and 41.73 inches in 54.2 rainy days the average of the past ten years. It is seen that the rains in the south-west monsoon in 1959-60 were less than in 1958-59 and the average of the past ten years; the rains in the north-east monsoon in 1959-60 were more than in 1958-59 and the average of the past ten years; the rains in the hot weather period in 1959-60 were more than in 1958-59 and the average of the past ten years. The distribution also was better than in the previous year. On the whole the rains and their distribution can be said to be quite normal.

*Field operation.*—Water for irrigation was received in the Cauvery Mettur Project Canal on 3rd July 1959 and was stopped on 28th February 1960. Kuruvai nursery sowing were started on 25th May 1959 even before the receipt of water in the canal with the help of water from the wells. The sowing of Samba and Thaladi nurseries were commenced on 1st August 1959 and 23rd September 1959 respectively. The Kuruvai, Samba and Thaladi plantings were started on 8th July 1959, 28th August 1959 and 28th September 1959 respectively. The area devoted to different varieties of paddy for seed multiplication and experiments in the three seasons of the year and also the area devoted to other crops are as follows :—

|                       | Kuruvadi paddy. | Samba paddy. | Thaladi paddy. | Other crops. |
|-----------------------|-----------------|--------------|----------------|--------------|
| (1)                   | (2)             | (3)          | (4)            | (5)          |
|                       | ACS.            | ACS.         | ACS.           | ACS.         |
| Experiments .. .. .   | 3.00            | 2.73         | 1.50           | ..           |
| ADT. 3 .. .. .        | 4.78            | ..           | ..             | ..           |
| ADT. 20 .. .. .       | 4.31            | ..           | ..             | ..           |
| TKM. 6 .. .. .        | 1.94            | ..           | ..             | ..           |
| Basumathi .. .. .     | 0.37            | ..           | ..             | ..           |
| Co. 25 .. .. .        | ..              | 3.06         | 4.69           | ..           |
| GEB. 24 .. .. .       | ..              | 1.57         | ..             | ..           |
| Co. 19 .. .. .        | ..              | 1.50         | ..             | ..           |
| PTB. 15 .. .. .       | ..              | 0.80         | ..             | ..           |
| White Puttu .. .. .   | ..              | 0.28         | ..             | ..           |
| Sugadas .. .. .       | ..              | 0.06         | ..             | ..           |
| Co. 7 .. .. .         | ..              | ..           | 0.50           | ..           |
| ADT. 8 .. .. .        | ..              | 0.25         | 4.95           | ..           |
| ASD. 5 .. .. .        | ..              | ..           | 2.18           | ..           |
| Co. 3 .. .. .         | ..              | ..           | 0.62           | ..           |
| AEB. 148 .. .. .      | ..              | ..           | 0.50           | ..           |
| AEB. 178 .. .. .      | ..              | ..           | 0.50           | ..           |
| ADT. 23 .. .. .       | ..              | ..           | 0.25           | ..           |
| Groundnut .. .. .     | ..              | ..           | ..             | 2.25         |
| Gingelly .. .. .      | ..              | ..           | ..             | 0.50         |
| Cotton P. 216 .. .. . | ..              | ..           | ..             | 0.80         |
| Total ..              | 14.40           | 10.25        | 15.69          | 3.55         |

*Seed distribution.—*

Seed, seedlings, cuttings, etc., distributed for propagation are given below—

|                                      | <i>Seeds.</i>  |                | <i>Seedlings,<br/>cuttings etc.,<br/>number.</i> |
|--------------------------------------|----------------|----------------|--------------------------------------------------|
|                                      | <i>Pounds.</i> | <i>Ounces.</i> |                                                  |
| ADT. 3 Paddy .. .. .                 | 7,495          | ..             | ..                                               |
| ADT. 8 Paddy .. .. .                 | 15,573         | ..             | ..                                               |
| ADT. 16 Paddy .. .. .                | 270            | ..             | ..                                               |
| ADT. 20 Paddy .. .. .                | 7,010          | ..             | ..                                               |
| ADT. 23 Paddy .. .. .                | 40             | ..             | ..                                               |
| Co. 7 Paddy .. .. .                  | 68             | ..             | ..                                               |
| Co. 19 Paddy .. .. .                 | 3,933          | ..             | ..                                               |
| GEB. 24 Paddy .. .. .                | 1,692          | ..             | ..                                               |
| Co. 25 Paddy .. .. .                 | 5,320          | ..             | ..                                               |
| TKM. 6 Paddy .. .. .                 | 3,252          | ..             | ..                                               |
| ASD. 5 Paddy .. .. .                 | 985            | ..             | ..                                               |
| PTB. 15 Paddy .. .. .                | 476            | ..             | ..                                               |
| AEB. 148 Paddy .. .. .               | 140            | ..             | ..                                               |
| AEB. 178 Paddy .. .. .               | 500            | ..             | ..                                               |
| Basumathi .. .. .                    | 162            | ..             | ..                                               |
| White Puttu .. .. .                  | 81             | ..             | ..                                               |
| Black Puttu .. .. .                  | 52             | ..             | ..                                               |
| Selection for trial .. .. .          | 162            | ..             | ..                                               |
| Total of paddy seeds .. .. .         | 47,210         | ..             | ..                                               |
| TMV. 1 Gingelly .. .. .              | 73             | 4              | ..                                               |
| TMV. 2 Groundnut .. .. .             | 1,164          | ..             | ..                                               |
| TMV. 3 Castor .. .. .                | 12             | ..             | ..                                               |
| Total of oil seeds .. .. .           | 1,249          | 4              | ..                                               |
| Sunn hemp seeds .. .. .              | 90             | ..             | ..                                               |
| Calopogonium .. .. .                 | 69             | ..             | ..                                               |
| Sesbania .. .. .                     | 50             | ..             | ..                                               |
| Gliricidia .. .. .                   | 15             | ..             | ..                                               |
| Kolinji .. .. .                      | 50             | ..             | ..                                               |
| Indigofera teysmanii .. .. .         | ..             | 8              | ..                                               |
| Total of green manure seeds .. .. .  | 274            | 8              | ..                                               |
| Bendai .. .. .                       | 45             | 1½             | ..                                               |
| Brinjal .. .. .                      | 27             | 14             | ..                                               |
| Snake gourd .. .. .                  | 2              | 13½            | ..                                               |
| Total of vegetable seeds .. .. .     | 75             | 12½            | ..                                               |
| Gliricidia cuttings .. .. .          | ..             | ..             | 47,406                                           |
| Gliricidia seedlings .. .. .         | ..             | ..             | 6,900                                            |
| Ipomoea cuttings .. .. .             | ..             | ..             | 2,300                                            |
| Total of green manure plants .. .. . | ..             | ..             | 56,606                                           |
| Acid lime seedlings .. .. .          | ..             | ..             | 823                                              |
| Nepali lemon seedlings .. .. .       | ..             | ..             | 868                                              |
| Jamberi seedlings .. .. .            | ..             | ..             | 5                                                |
| Jack seedlings .. .. .               | ..             | ..             | 141                                              |
| Papaya seedlings .. .. .             | ..             | ..             | 44                                               |
| Rose apple seedlings .. .. .         | ..             | ..             | 15                                               |
| Total of fruit seedlings .. .. .     | ..             | ..             | 1,896                                            |

|                                      | <i>Seeds.</i>  |                | <i>Seedling<br/>cutting, etc.,<br/>number.</i> |
|--------------------------------------|----------------|----------------|------------------------------------------------|
|                                      | <i>Pounds.</i> | <i>Ounces.</i> |                                                |
| Grape vine cuttings .. .. .          | ..             | ..             | 12                                             |
| Nepali lemon layers .. .. .          | ..             | ..             | 30                                             |
| Nepali lemon cuttings .. .. .        | ..             | ..             | 53                                             |
| Jamberi cuttings .. .. .             | ..             | ..             | 6                                              |
| Malta lemon cuttings .. .. .         | ..             | ..             | 22                                             |
| Malta lemon layers .. .. .           | ..             | ..             | 3                                              |
| Mango grafts .. .. .                 | ..             | ..             | 5                                              |
| Jack grafts .. .. .                  | ..             | ..             | 4                                              |
| Total of fruit cuttings .. .. .      | ..             | ..             | 135                                            |
| Brinjal seedlings .. .. .            | ..             | ..             | 1,547                                          |
| Tomato seedlings .. .. .             | ..             | ..             | 400                                            |
| Curry leaf seedlings .. .. .         | ..             | ..             | 154                                            |
| Chekkurmanis cuttings .. .. .        | ..             | ..             | 14                                             |
| Banana suckers .. .. .               | ..             | ..             | 55                                             |
| Total of vegetable seedlings .. .. . | ..             | ..             | 2,170                                          |
| Areca nut seedlings .. .. .          | ..             | ..             | 215                                            |
| Country almond seedlings .. .. .     | ..             | ..             | 12                                             |
| Neem seedlings .. .. .               | ..             | ..             | 625                                            |
| Pungam seedlings .. .. .             | ..             | ..             | 3,700                                          |
| Kapok seeds and seedlings .. .. .    | 11             | ..             | 8,673                                          |
| Nelli seedlings .. .. .              | ..             | ..             | 88                                             |
| Total of miscellaneous seeds .. .. . | 11             | ..             | 13,313                                         |
| Croton cuttings .. .. .              | ..             | ..             | 436                                            |
| Ornamental tapioca cuttings .. .. .  | ..             | ..             | 443                                            |
| Jasmine layers .. .. .               | ..             | ..             | 45                                             |
| Total of ornamental plants .. .. .   | ..             | ..             | 924                                            |
| Buffalow grass slips .. .. .         | ..             | ..             | 400                                            |
| Napier grass slips .. .. .           | ..             | ..             | 225                                            |
| Elephant grass slips .. .. .         | ..             | ..             | 300                                            |
| Guinea grass slips .. .. .           | ..             | ..             | 8,825                                          |
| Total of fodder grasses .. .. .      | ..             | ..             | 9,750                                          |

*Research—1 Pure line selection.*—(1) Mattaikuruvai in kuru-vai season. Nine selections in this variety together with the standard were compared among themselves for yield. Though four selections have recorded slight increase over the standard the differences were not statistically significant. All the selections have been sown for repeating the yield trial for one more season.

(2) Kodaivellai, Kattaivellai and Kaivarisamba in the samba season. Two selections in each of Kattaivellai and Kodaivellai, and three selections in Kaivarisamba were compared against the respective standard in three yield trials. Kodaivellai and



Kattaivellai selections gave lesser yields than the standards and the Kaivarisamba selections gave better yields than the standard even though the differences in all these three groups were not statistically significant.

II. *Hybridization*.—(1) ADT. 15 × ASD. 8 progenies. Three selections, from among these progenies were compared against ADT. 15 in an yield trial. Selection 1656 maintained its superiority over ADT. 15 with an increase of 10 per cent and it was followed by the other two selections 1657 (E) and 1657 (L) which recorded 5 per cent increase over ADT. 15. But none of these three was shorter in duration than that of ADT. 15. These have been sown again for further trial.

(2) Progenies of CH. 2 × ADT. 3 progenies of this cross, 39 in number, were put under preliminary yield trial with three replications and in four groups. No useful data could be gathered on account of the fact that the crop was caught in the rain at the time of harvest. These selections have been sown once again this season for repetition of the trial.

III. *Improvement by mass selection*.—Based upon the information and materials gathered during a survey of the tract, it was seen that a number of important varieties exist in these parts, each one occupying a fairly large area, but not extensive enough to warrant a full fledged pure line selection work in them. To meet the demand from ryots in these areas, it was decided to have mass selection and purification in four of these important minor varieties—Sindhivavanam, Kachakoombalai, Seenganni and Kachakodavalli. In these varieties, small quantities of samples are on hand and some more samples will be collected from ryots' field when the crops are in ears.

IV. *Improvement by introduction*.—(1) Trial of short duration Chinese varieties, in Kuruvai season. Six Chinese varieties, were compared with ADT. 20, and ADT. 3 for their yield in the Kuruvai season. In all the seasons tried so far, nothing was found in favour of these Chinese varieties. These have been sown once again for a repetition of the trial.

(2) Interstrain trial in the Kuruvai season. Twenty-one Kuruvai and kar duration strains were under comparison for yield in two groups. The differences in yield were statistically significant in both the groups. In the kar duration group strains Co. 20 and Co. 23 were found unsuitable on account of their long duration. Other strains did not prove themselves to be better than ADT. 9. In the Kuruvai duration group, ASD. 8 had the shortest duration and selection 6522, strains TKM. 3 and TKM. 6 yielded better than ADT. 3. But these had a slightly longer duration than ADT. 3.

Interstrain trial in the samba season. Twenty-one medium and long duration strains of paddy from other breeding centres were compared among themselves for their performance in two groups with ADT. 8 as the standard for both the groups. In medium duration group, strain PTB 15 has the best yield and Co. 26 and Co. 25 were the best performers in the long duration group.

(3) Trial of strains and selections which have done well in the drought resistance scheme. The work on this item is yet to be commenced and the necessary materials have come from the Paddy Breeding Station, Coimbatore.

V. *Manurial experiments*.—(1) Varietal response to manures experiment. The results got from the thaladi and samba seasons were sent to the Statistical Assistant at Coimbatore and findings are awaited.

(2) Fractional application of ammonium sulphate experiment. This experiment was repeated in all the three seasons of the year and the results from the samba and thaladi seasons were analysed. The differences in yield due to the various treatments were not statistically significant in both the samba and thaladi seasons.

#### *Agricultural Research Station, Tindivanam.*

*Season*.—A total rainfall 33.59 inches distributed over 45 rainy days were received as against 39.06 inches on 50 days last year and the ten years average of 34.12 inches on 45.8 days. The rainfall was deficit to an extent of 4.03 inches and 3.45 inches during the south-west monsoon and hot weather period respectively and in excess of the normal by 6.95 inches during the north-east monsoon. The late sowings of groundnut with a spell of drought during the first flowering affected the yield to a slight extent. The cold-weather, gingelly sown with the receding rains of the north-east monsoon during the first week of December was a failure due to the prevalence of drought during crop growth. The season in general was favourable for castor, slightly unfavourable to groundnut and for cold weather gingelly. During the hot weather only 1.16 inches was received during the third week of March and May 1960. This has adversely affected the water-supply in well.

A. *Groundnut*.—A spreading selection A.H. 6857 (East Africa) consistently superior to all the three standards in three years of trial at the station and recording an average increase of 44.3, 32.7 and 28.7 per cent over local, strains TMV. 1 and TMV. 3 respectively was multiplied for trials in the districts during 1960-61. Two selections in bunch and nine of the spreading were in different stages of yield trials in comparison with their respective standards. One of the bunch selections, A.H. 6875 recorded 2.8 per cent increase over TMV. 2 and was on a par with it. The yield differences were not significant in the yield trials with nine spreading selections. However, all the nine selections



yielded 4.5 to 15.1 per cent more than the local. One of these, A.H. 6885 in the third year of trial, registered an average increase of 37.7, 16.4, and 25.6 per cent over local and strains TMV. 1 and TMV. 3 respectively. This will be multiplied for field tests in ryots holdings during 1961-62. Five spreading selections that out-yielded local in replicated row trials conducted during the 1958-59 were multiplied. In the new cultural trials with four main and two sub-treatments conducted for the third year, the yield differences were not significant both in the main and sub-treatments. However, "Ploughing four times with iron plough" in the main treatment and "Working Danthis four times" in the sub-treatment yielded 6.3 and 1.3 per cent increases respectively over their controls. In the spacing trials, broader spacings of 24 inches  $\times$  3 inches, 18 inches  $\times$  4 inches and 12 inches  $\times$  6 inches in the spreading variety recorded 12.9, 6.9 and 4.4 per cent over 9 inches  $\times$  8 inches (control). In the same trial with the bunch variety, all boarder spacings 9 inches  $\times$  4 inches, 18 inches  $\times$  2 inches and 12 inches  $\times$  3 inches gave 1.7, 1.4 and 0.8 per cent increases respectively over the normal spacing of 6 inches  $\times$  6 inches. In the fertilizer placement trials with two manure mixtures with three placements in each conducted for the sixth year with spreading for the third year with the bunch, the yield differences were not significant. However, cattle manure at 5 tons per acre recorded the highest yield of 13.1 per cent increase over "No manure" (control), in the bunch and treatment "MM 2 broad cast" in the spreading variety registered the highest increase of 19.2 per cent over control. A new experiment on legume rotation with six main three course rotational treatments with all the three phases represented as sub-plots was repeated for the third year. Twelve high yielding selections comprising four in each of the bunch, semi-spreading and spreading were field tested in 26 centres in the districts. The bunch selections registered increased yields ranging from 8.7 to 91.7 per cent, the semi-spreading selections recorded increases ranging from 3.4 to 77.8 per cent and the spreading selections recorded increased yields ranging from 5.8 to 66.7 per cent over the local varieties. A high yielding bold seeded semi-spreading selection, A.H. 6719 awaits release as a new strain suitable for dessert purposes under the trade name H.P.

**B. Gingelly—1959-60 cold weather.**—Five selections were compared in yield trial with local and strain TMV 2 for the first year. The yield differences were significant. Four out of the five were significantly superior to both the standards, yielding 11.6 to 32.9 per cent more than local. Twelve selections were compared with local and TMV. 2 in two sets of preliminary yield trials. The yield differences were not significant, though 11 out of 12 recorded increased yields upto 37.5 per cent over local. In addition, 29 selections were studied in two sets of replicated row trials.

**1960 summer.**—Ten selections, were compared with strain TMV. 3 in two groups of yield trials. Of these, six were tested for the

third year and the other four advanced from 1958 summer for the first year. Ten and 17 selections were also tested in two sets of preliminary yield trials and three groups of replicated row trials in comparison with strain TMV. 3. Thirty-one varieties and two X-ray induced mutants and their parents were also studied in great detail. The X-ray induced mutants did not reveal any appreciable differences in yield when compared to strain TMV. 2. Eighty-five selections from the F<sub>2</sub> progenies of crosses designed for the evolution of white seeded cosmopolitan strains were studied. In addition, 14 fresh crosses were made for the same purpose. The new manurial experiment was repeated for the third year.

**C. Castor.**—Two short duration selections, R.C. 1146 (X-118/1-Horticultural type  $\times$  TMV. 1) and R.C. 1147 (X-99/47-Namak-kal  $\times$  Kumbakanam) maturing in 5½ months and recording 18.4 and 18.8 per cent increases respectively over TMV. 2 in three years of yield trial at this station were multiplied for trials in the cultivators holdings in the districts during 1960-61. Three selections were tested in yield trials for the second year. The yield differences were not significant, though all the three recorded increased yields ranging from 10.8 to 35.7 per cent over TMV. 1. In the preliminary yield trials with seven short duration selections, the yield differences were not significant. Four of the seven registered increased yields up to 15.2 per cent over the general mean taken as the standard. Five out of the eight selections studied under replicated row trials yielded 7.0 to 43.6 per cent more than the general mean and were on a par with it. The three short duration cultures, R.C. 1074, 1075, and 1076 recorded increased yields ranging from 4.9 to 16.3 per cent in Mathurai, 34.4 to 98.8 per cent in North Arcot and 97.8 to 176.9 per cent over local in Salem district. These three and two others R.C. 1146 and 1147 were issued for trials in 17 centres in the districts. One hundred and sixty-one inbreds were maintained pure. Five selections from purity studies were advanced to replicated row trials. Twenty-two fresh crosses were made between selected parents to reduce the duration and impart colour to the existing strains. One hundred and sixteen single plants were advanced for further study from F<sub>2</sub> and F<sub>3</sub> progenies of crosses designed for the same purpose. Ten families of hybrids from the crosses between highly pistillate strain TMV. 1 and ten high yielding inbreds were compared with TMV. 1 both in compact family blocks and replicated row trials. The yield differences were significant in both the trials. Cross X. 247 (TMV. 1  $\times$  R.C. 820-Russian 13) exhibited superior performance in both the trials. Sib X. 247/3 in this cross recorded the highest yield of 53.0 per cent increase over TMV. 1. In the manurial trial conducted for the sixth year, the differences in yield due to treatments were significant and treatments NP., NPK., NK. and N. were significantly superior to "No manure" (control) recording increased yields ranging from 150.3 to 178.8 over control.

**Schemes—(i) Intensive breeding of groundnut in the Madras State.**—This scheme was started on 30th June 1955 with the object of evolving high yielding strains by pureline selection from new varieties and by hybridisation to evolve (a) high yielding dormant bunch strains, (b) high yielding white seeded types, (c) big seeded edible types and (d) to improve the shelling outturn of strain TMV. 1.

Four hundred and seventy new varieties representing collections from India and geographical races were studied and 103 single plants were made. Sixty-three promising selections from purelines were multiplied for conducting yield trials during 1960-61. In addition, 467 selections were also under initial yield trials and 117 of these superior to their standards were advanced to further stages of trials. Under the hybridisation programme for the four set purposes of the scheme, 17 dormant bunch selections, 13 white seeded selections 32 big seeded and 22 others with good shelling outturn were advanced to rigid yield trials. As many as 1,447 selections from the F2 and F3 progenies of crosses and back crosses were in different stages of study and initial yield trials.

**(ii) Scheme for the running of zonal Nucleus seed farms of groundnut and castor.**—During the period, an area of 54 acres was sown with groundnut strains TMV. 1, TMV. 2 and TMV. 3 and castor strain TMV. 2. The details of area sown under each strain, quantity produced, yield per acre in lb. total quantity of picked pods obtained and quantity distributed are presented in the table below :—

*Statement of quantity of seeds of groundnut and castor produced and distributed from Zonal Nucleus Seed Farm, Tindivanam, for the period from 1st July 1959 to 30th June 1960.*

| Strain number.    | Area sown in acres. | Total quantity of dry pods/beans obtained in lb. | Yield per acre in lb. | Target fixed in lb. | Total quantity of picked pods/beans obtained in lb. | Quantity despatched to the District Officers in lb. |
|-------------------|---------------------|--------------------------------------------------|-----------------------|---------------------|-----------------------------------------------------|-----------------------------------------------------|
| (1)               | (2)                 | (3)                                              | (4)                   | (5)                 | (6)                                                 | (7)                                                 |
| <i>Groundnut.</i> |                     |                                                  |                       |                     |                                                     |                                                     |
| TMV. 1            | 10.00               | 8,055                                            | 806                   | 7,500               | 5,776                                               | 4,565                                               |
| TMV. 2            | 13.69               | 10,130                                           | 740                   | 7,000               | 7,470                                               | 5,498                                               |
| TMV. 3            | 25.00               | 18,214                                           | 728                   | 18,125              | 14,490                                              | 11,620                                              |
| <i>Castor.</i>    |                     |                                                  |                       |                     |                                                     |                                                     |
| TMV. 2            | 5.00                | 5.10                                             | 102                   | 4,500               | 360                                                 | 360                                                 |

**(iii) Tractor hiring scheme.**—This scheme was implemented in G.O. Ms. 985, Food and Agriculture, dated 30th March 1955 and is being continued year after year. This is continued as per current sanction in G.O. Ms. No. 1207, Food and Agriculture, dated 26th March 1960 for a period of one year. During the period, a target

of 250 acres for tractor hiring ploughing was fixed. Of this, 35 acres were ploughed and a revenue of Rs. 420 was realized. The coverage is low due to the sick nature of the tractor, and non-availability of some of the spare parts.

**(iv) Establishment of comprehensive coconut nursery scheme.**—This scheme was sanctioned in G.O. Ms. No. 2200, Food and Agriculture, dated 20th July 1958 under the Second Five-Year Plan and is due to terminate on 30th September 1961. This was initiated at the Agricultural Research Station, Tindivanam, on 11th November 1957, this being one of the four centres of operation. The scheme contemplates the procurement of 40,000 seed-nuts from reputed centres to yield 30,000 good seedlings for distribution to ryots. This report covers the third year of the scheme. Of the 40,000 seed-nuts planted 26,520 germinated with the germination percentage of 66.3. This was due to the late planting consequent on the failure of both the summer showers and late setting of south-west monsoon. A total of 16,698 quality seedlings were distributed to Departmental Officers and public. Due to inadequacy of irrigation facilities at this centre to tackle 40,000 seed-nuts the nursery was bifurcated and a target of 20,000 seed-nuts was fixed for each of the centres at Tindivanam and Padalam. Lands to an extent of 1.92 acres was taken on lease and the Padalam nursery commenced functioning on 29th January 1960 with the transfer of one Fieldman and Demonstration Maistries from Tindivanam to the new centre. A total of 32,450 seed-nuts were procured during April and May 1960 for both the nurseries as per details furnished below. The seed-nuts were properly stored at both the centres. Seed beds are being raised at Padalam.

| Centre.       | Plants from which seed nuts were procured. | Quantity procured numbers. |
|---------------|--------------------------------------------|----------------------------|
| (1)           | (2)                                        | (3)                        |
| Tindivanam .. | Vaniyambadi ..                             | 20,000                     |
| Padalam ..    | (i) Vaniyambadi ..                         | 9,700                      |
|               | (ii) Edakanad ..                           | 2,750                      |
|               |                                            | 12,450                     |
|               | Grand total ..                             | 32,450                     |

**(v) Cashewnut Development Scheme.**—The scheme sanctioned in G.O. Ms. No. 1844, Food and Agriculture, dated 26th May 1960 had the main objective of procurement of quality seeds from high-yielding trees for distribution on long term loan and to supply quality seedlings to ryots for increasing the production of cashewnut. Tindivanam is one of three centres selected for the purpose.

The scheme started functioning from 15th October 1959 with the posting of an Horticultural Assistant. Details regarding the quantity of seeds and seedlings distributed, are given in the table below :—

|                                                              | LB.   |
|--------------------------------------------------------------|-------|
| (i) Quantity of seeds procured .. ..                         | 6,400 |
| (ii) Quantity of seeds issued for loan purpose.              | 423   |
| (iii) Quantity of seeds issued for general purposes.         | 3,152 |
| (iv) Quantity of seeds supplied to officers of other States. | 2,760 |
| (v) Number of seedlings distributed .. ..                    | 150   |

Miscellaneous—(i) *Manure*.—One hundred and eighteen tons of farm yard manure and 164 tons of compost were produced.

(ii) *Paddy*.—Strain TKM. 6 was raised in an area of 2.06 acres which recorded an average yield of 1,933 lb. grain and 2,900 lb. straw. The yield is low due to late planting.

(iii) *Seed distribution*.—The following quantities of seeds and plants were distributed :—

|                              |               |
|------------------------------|---------------|
| Groundnut pods .. .. .       | 4,242 lb.     |
| Groundnut kernels .. .. .    | 117 "         |
| Gingelly .. .. .             | 2,797 "       |
| Castor .. .. .               | 2,050 "       |
| Paddy .. .. .                | 6,968 "       |
| Cholam, Co. 19 .. .. .       | 242 "         |
| Redgram S.A.I. .. .. .       | 106 "         |
| Gliricidia seeds .. .. .     | 14 "          |
| Sesbania seeds .. .. .       | 22 "          |
| Bhendai seeds .. .. .        | 3 "           |
| Ragi AKP 1 .. .. .           | 5 "           |
| Kapok seeds .. .. .          | 74 "          |
| Gliricidia cuttings .. .. .  | 4,752 Number. |
| Gliricidia seedlings .. .. . | 5,600 "       |
| Sesbania seedlings .. .. .   | 18,400 "      |
| Neem seedlings .. .. .       | 200 "         |
| Pungam seedlings .. .. .     | 250 "         |
| Kapok seedlings .. .. .      | 200 "         |
| Cassia seedlings .. .. .     | 200 "         |
| Prosopis seedlings .. .. .   | 100 "         |
| Guinea grass slips .. .. .   | 300 "         |
| Tomato seedlings .. .. .     | 50 "          |

(iv) *Summary*.—A high-yielding big seeded semi-spreading selection A.H. 6719 awaits release as a new strain. Twelve economic selections were under field trials in 26 centres in the districts. They have recorded an average increase of 40.3 per cent over the local varieties. A high-yielding spreading selection, A.H. 6857 has been added on the list of 12 selections that are already under trials in the districts. In addition a selection A.H. 6885 of the spreading variety is promising in all the three years of yield

trials at the station and is ready for multiplication for field tests during 1961-62. But as the results are still in trial stage, it is not possible to compute exactly the benefit of economic gain that would result by the adoption of results. Judged by the distribution of 32,649 lb. seeds of improved strains of the three major oilseed crops of the State both from the station and Zonal Nucleus Seed Farm stock, it may be said that it would be capable of spreading in an area of 1,226 acres at the outset and a greater area under natural spread in due course. This would result on a moderate estimate of an additional production of 162,705 lb. seed valued at Rs. 47,667.

#### *Groundnut Research Station, Pollachi.*

*Schemes*.—The following schemes financed by the India Central Oilseeds Committee and the State Government were in progress during the year :—

(1) Scheme for the improvement of the 'Pollachi Red' Groundnut in Madras State.

(2) Scheme to run six Zonal Nucleus Seed Farms in Groundnut and Castor.

*Season and rainfall*.—The south-west monsoon rains were received late and a total quantity of 601.7 m.m. rains was recorded during the period.

The north-east monsoon broke in the second half of October 1959 and was active to the end of December 1959. The total rainfall recorded during the period was 534.00 m.m.

The summer was rather mild and the months of January, February and March were dry. Rains were received early in April 1960 and the total quantity recorded during the month was 146.7 m.m.

*Groundnut crop*—(i) *1959 Season*.—The sowings were done late in May. Sprouting was uniform, but the continuous wet weather prevailed during the month of July adversely affected the maturity and yield of the crop. The 'red hairy' caterpillar that appeared on the crop was effectively checked by timely dusting of B.H.C. 10 per cent. There was also severe attack of 'aphids' but the heavy downpour in the month of July controlled the pest.

(ii) *1960 season*.—The sowings were done early in April 1960 and the germination was satisfactory. But the growth and flower production were affected by the severe drought that prevailed during the period. With the receipt of rains in the second half of June the crop revived. The incidence of the 'red hairy' caterpillar and 'aphids' was rather mild and the pests were controlled by timely protective measures.

*Scheme for the improvement of the Pollachi Red groundnut in Madras State*.—(i) *Introduction and acclimatization of varieties*.—The existing collection of 206 varieties including 105 new varieties obtained from different sources were raised during 1959 season and studied. The study revealed that 69 varieties possessed higher

yielding capacity than the local "Pollachi red" and 51 were found to be superior to strain TMV. 2. It was also observed that 36 among them recorded higher shelling percentage than the local "Pollachi Red" groundnut. The entire collection have again been sown for study during the 1960 season.

(ii) *Collection and testing of varieties from other parts of the State, India and World.*—The comparative trial of the seven bunch purelines was conducted for the third year in succession during 1959 season. Three of them, viz., A.H. 4218, A.H. 6179 and A.H. 6279 were found to be superior to the local "Pollachi red" sown under the scattered block trials in district centres. These three bunch cultures have been repeated. Four red seeded bunch selections which were first studied under comparative yield trials during 1959 have again been put under test for the second year during 1960.

(iii) *Selection of single plants from ryots bulk and testing them for yield and quality.*—The trial of the seven mass selections from the local "Pollachi red" groundnut were tried for the third year in succession during 1959 under comparative yield trials. The results were not encouraging and the trial has been repeated for the fourth year during 1960. A second set of four mass selections made from Angalakurichi, Sedimuthur, Poochanari and Vadakipalayam centres was put under comparative yield trials for the first time during 1959 season and the trial has been repeated during 1960.

One hundred and fifty-two selections were put under replicated row tests during 1959. Forty of them were found promising and have been advanced to further trial. Two hundred and seventy selections that out-yielded their adjoining controls during 1959 were put under replicated row trials during 1960 and the crop is on the field.

Out of 503 single plant selections tried under row tests during 1959 318 out-yielded their adjoining controls and 270 out of them have been advanced in the replicated row test. One hundred and eighty-one fresh selections have been put under row tests during 1960 season.

(iv) *Hybridisation to evolve strains of "Pollachi Red" groundnut with dormant seeds.*—The F<sub>1</sub> and F<sub>2</sub> progenies of crosses were raised and studied during 1959. Fresh crosses with "Pollachi red" groundnut and the eight purelines were also made. A total of 166 selections from progenies of crosses have been put under replicated row trials and row tests during 1960 season.

*Scheme for the Zonal Nucleus Seed Farm, Pollachi.*—This is the third year of the scheme under the extension scheme sanctioned in G.O.Ms. No. 1766, Food and Agriculture, dated 7th June 1957. The object of the scheme at this centre is to multiply and distribute on a large scale the improved strains of groundnut, namely

TMV. 1, TMV. 2, TMV. 3 and TMV. 4, on a Zonal basis for further multiplication in the district centres. All the four strains were raised during 1959 monsoon season and the details regarding the area grown, yield obtained and the target of production and achievements are given below :—

The target could not be achieved due to the unfavourable seasonal conditions that prevailed during the stages of flowering and pod formation.

The three strains of groundnut, namely TMV. 2, TMV. 3 and TMV. 4 were sown in the area shown below during 1960 monsoon for multiplication :—

| Strains, | Area in acres. |
|----------|----------------|
| TMV. 2   | 35.00          |
| TMV. 3   | 10.00          |
| TMV. 4   | 5.00           |

The crop is on the field and the growth is satisfactory.

*Miscellaneous*—(i) *Increasing the Revenue of the Station by Raising Catch Crops.*—With the object of increasing the revenue of the station and utilising the land in the off season, horsegram (D.B. 35) was raised over an area of 10.00 acres. A total quantity of 8,591 lb. seeds was obtained. The vines were composted.

(ii) *Advisory work.*—A large number of farmers and village leaders visited the station during the year. They were taken round the farm and the objectives and achievements were explained to them. Enquiries from ryots regarding the cultivation of groundnut, pests and diseases that affect the groundnut crop and their control measures, etc., were promptly attended to.

(iii) *Exhibition.*—Oilseed exhibits, plant specimens and charts were sent to Coimbatore, for arranging exhibition on various occasions. The station also participated in the "Red hairy" caterpillar campaign in the taluk and in the exhibition organised on the occasion of the visit of His Excellency the Governor of Madras to Pollachi.

(iv) *Farmers' Day.*—The Farmers' Day was celebrated on the 4th June 1960, Sri N. Mahalingam, B.Sc., A.I.M.E., M.L.A., presided on the occasion. Sri P. K. Palaniswami Gounder, President of Taluk Congress Committee opened the exhibition. The Joint Director of Agriculture (Planning and Development), Madras, the Deputy Director of Agriculture, Coimbatore, Millet and Pulses Specialist, Cotton Extension Officer and Government Mycologist, Coimbatore took part in the function. Villagers from the neighbouring villages attended the celebration.

(v) *Seed and seed distribution.*—The following quantity of seeds of improved strains were distributed during the year :—

| Name of the strain. | Quantity of seeds distributed. | Average percentage of increased production. | Estimated area corrected in acres. | Additional production in tons. | Monetary gain in rupees. |
|---------------------|--------------------------------|---------------------------------------------|------------------------------------|--------------------------------|--------------------------|
| (1)                 | (2)                            | (3)                                         | (4)                                | (5)                            | (6)                      |
| TMV. 1 .. ..        | 3,946                          | 20                                          | 25                                 | 2.5                            | 1,300                    |
| TMV. 2 .. ..        | 3,610                          | 20                                          | 23                                 | 2.3                            | 1,200                    |
| TMV. 3 .. ..        | 1,990                          | 20                                          | 13                                 | 1.3                            | 660                      |
| TMV. 4 .. ..        | 890                            | 20                                          | 6                                  | 0.6                            | 290                      |

*Agricultural Research Station, Palur.*

1. *Season.* A total rainfall of 38.88 inches was received on 44 days as against 34.98 inches on 56 rainy days on the previous year. The average rainfall for the past ten years was 39.15 inches on 53 days. The rainfall was adequate for the dry crops. Water flowed in the Gadilam River from middle of October. The rainfall was rather heavy in the first and last week of November and the lower areas of the farm were inundated due to floods from the river. As usual the period of drought set in from the middle of December and the Navarai crop of paddy and other garden land crops were maintained by lift irrigation, entailing heavy load on the five oil engines in the farm. The yield of paddy crop in the four seasons and other garden land crops was satisfactory.

2. *Crops.*—The following are the highest records of yield of the various crops during the year :—

| Crop.           | Strain. | Season.          | Acre yield in lb. |
|-----------------|---------|------------------|-------------------|
| Paddy .. ..     | TKM. 6  | Sornavari ..     | 4,257             |
|                 | Co. 19  | Samba ..         | 3,888             |
|                 | ASD 11  | Thaladi ..       | 2,900             |
|                 | TKM. 6  | Navarai ..       | 3,306             |
| Ragi .. ..      | PLR. 1  | December-May ..  | 2,172             |
| Groundnut .. .. | TMV. 2  | April to June .. | 1,650             |

*Paddy.*—Chinese types CH. 62, Ch. 63 and CH. 42 were compared with PLR. 2 for the eighth year in the Sornavari season. PLR. 2 recorded the highest yield and the types CH. 42 and Ch. 62 yielded on a par with PLR. 2 of the medium duration strains and cultures 6,538 recorded significantly the highest yield in the Samba Season and was found superior to GEB. 24 and BAM. 3. Short duration strains TKM. 6, PLR. 2, SW. 1251, ADT. 18, ADT. 23 and ADT. 12 were under trial in two series during the Navarai season along with the promising blast resistant culture 6,522, 6,517, 7,332 and 7,680. The performance of culture 6,517 was superior to TKM. 6 and PLR. 2, culture 7,332 yielded on a par with ADT. 18.

Three Sornavari Cultures 1,691, 8,888 and 1,886 were compared against standard SW 1,251, PLR. 2 and TKM. 6. PLR. 2, recorded the highest yield and was on a par with SW. 1,251, TKM. 6 and cultures 8,888 and 1,691. In pure line selections in Thilainayagam, forty selections were under yield trial in a typical saline field at Kandadu near Markanam. Culture 4,124 recorded the highest yield and is found to be promising from the consistently high yields of the previous seasons. Sixty-three primary selections and five cultures of seevan samba were under yield trial. Culture 4,159 was superior to PLR. 1 and is promising. Thirty-nine selections of Thuyamalli samba were under yield trial against GEB. 24 in two series. Two selections, viz. 4,241 and 4,212 recorded the highest yields. Twenty-two cultures were superior to GEB. 24 and seventeen others yielded on a par with GEB. 24. Mottakar culture 10,169 and Vellakar cultures 10,015 and 10,077 yielded higher than the Standards TKM. 6 and PLR. 2 during the Navarai season.

A total of 23 short duration and 40 medium duration progenies of the Japonica × Indica (A.D.T. 12 and G.E.B. 24) crosses were carried forward from the last year's trial and were laid out in compact family block during the period. The differences in yield were significant and the trial was proposed to be repeated during the 1960-61 seasons. In the trial of aekali resistant cultures in ryots, holdings at Kandadu, culture 416 and C.B.E. 153 were found superior to SR. 26 B cultures. 342, 212, 479, 476, 455, 6680, 6619 and C.B.E. 150 yielded on a par with SR. 26. B. Four blast resistant cultures of the crosses Co. 26 × Co. 19, namely, 4,234, 4,236, 4,258 were significantly superior to Co. 19 and were on a par among themselves. Culture 4,234 recorded the highest yield and was superior to Co. 26. In the item of work for the evolution of a strain of better grain quality than PLR. 1, culture 4,555 and 4,643 of the cross PLR. 1 × Co. 19 were found to yield better than PLR. 1. The performance of culture 4,555 in the previous season has been consistently good.

The permanent manurial experiment was continued during the year to find out the use of lime and its effect of mineralization of organic nitrogen supplied as farm yard manure, compost and green leaf. Treatments with farm yard manure and compost recorded higher yield than the other treatments. In the experiment to find out the response of varieties to manuring during the samba season Co. 19 indicated a trend of improved yields with increased doses of manure. The differences of yield due to the various manurial treatments to the varieties were not significant. In another experiment to find out the time of application of ammonium sulphate in two or three doses it was found that the differences in yield between treatments were not significant in the Sornavari, Samba and Navarai seasons.

Pretreatment of paddy seed with sodium bicarbonate was found to increase yield in China. In the trial conducted at this station it was found that the treatment of seed with 2.8 per cent sodium bicarbonate solution soaked for 48 hours, drained and kept for a day before sowing recorded the highest yield both in Samba and Navarai seasons of the year.

*Ragi*.—In the comparative yield trial of ragi strains and cultures, PLR. 1. recorded the highest yield during the December-April season. The differences in yield were not significant in the trial during the May-September season.

*Cumbu*.—Two cultures AC. 146 and AC. 130 were found superior to the strain Co. 3.

*Varagu*.—To evolve a higher yield strain than local varagu and varagu P.1 a yield trial with varagu cultures was conducted. Culture AV. 155 was found to yield better than P1, though the yield was statistically only on a par with P1. Culture AV. 217 and PS. 76 yielded very low.

*Poultry*.—The Rhode Island Red Breed of fowls is being continued to be maintained.

#### *Papers published—*

|                                                                                               |                                                    |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------|
| Mixed Cropping by<br>Sri R. M. Alagappan,<br>K. Thandavarayan and<br>M. K. Venkatasubramanian | Madras Agricultural Journal<br>April 1960 XLVII.4. |
| Cultivation of Bhendai<br>(Tamil) By R. M. Alagappan.                                         | Mezhiselvam 17-12 (9).                             |
| Improved method of cultivation.                                                               | ..                                                 |
| TMV. 2. Groundnut (Tamil)<br>by Sri S. Charles Daniel.                                        | Mezhiselvam 18-5 (16).                             |

*Particulars of seed and plants distributed are furnished below :—*

|            | Seeds.  | Quantity<br>in pounds. |
|------------|---------|------------------------|
| 1 Paddy—   |         |                        |
| 1 ADT. 3   | .. .. . | 800                    |
| 2 ADT. 8   | .. .. . | 250                    |
| 3 ADT. 12  | .. .. . | 6                      |
| 4 ADT. 20  | .. .. . | 1,740                  |
| 5 ADT. 25  | .. .. . | 1,259                  |
| 6 ADT. 6   | .. .. . | 2,010                  |
| 7 ASD. 11  | .. .. . | 390                    |
| 8 BAM. 3   | .. .. . | 50                     |
| 9 CO. 2    | .. .. . | 200                    |
| 10 CO. 13  | .. .. . | 250                    |
| 11 Co. 18  | .. .. . | 15                     |
| 12 Co. 19  | .. .. . | 1,611                  |
| 13 Co. 25  | .. .. . | 5,578                  |
| 14 GEB. 24 | .. .. . | 109                    |
| 15 PLR. 1  | .. .. . | 1,682                  |

|                          | Seeds.  | Quantity<br>in pounds. |
|--------------------------|---------|------------------------|
| 16 PLR. 2                | .. .. . | 1,413                  |
| 17 SW. 1251              | .. .. . | 156                    |
| 18 TKM. 6                | .. .. . | 365                    |
| 19 TKM. 3                | .. .. . | 259                    |
| 20 1246 Culture          | .. .. . | 9                      |
| 21 4388                  | .. .. . | 9                      |
| 22 7521                  | .. .. . | 9                      |
| 23 10169                 | .. .. . | 9                      |
| 24 10178                 | .. .. . | 9                      |
| 25 10047                 | .. .. . | 9                      |
| 26 10077                 | .. .. . | 9                      |
| 27 10015                 | .. .. . | 9                      |
| 28 CH. 62                | .. .. . | 9                      |
| 29 Basumathy             | .. .. . | 19                     |
| 2 Ragi—                  |         |                        |
| PLR. 1                   | .. .. . | 4,262                  |
| Co. 2                    | .. .. . | 150                    |
| Co. 5                    | .. .. . | 147                    |
| Co. 7                    | .. .. . | 1,075                  |
| AKP. 1                   | .. .. . | 965                    |
| 3 Cholan—                |         |                        |
| Co. 9                    | .. .. . | 5                      |
| Co. 19                   | .. .. . | 5                      |
| 4 Cumbu—                 |         |                        |
| Co. 3                    | .. .. . | 1,200                  |
| 5 Varagu—                |         |                        |
| Co. 1                    | .. .. . | 1,725                  |
| 6 Pulses—                |         |                        |
| Co. 1. Horse Gram        | .. .. . | 925                    |
| Co. 1. Green Gram        | .. .. . | 5                      |
| 7 Oil seeds—             |         |                        |
| TMV. 2 Groundnut pods    | .. .. . | 4,368                  |
| TMV. 3 Castor seeds      | .. .. . | 185                    |
| TMV. 2 Gingelly seeds    | .. .. . | 349                    |
| 8 Vegetables seeds—      |         |                        |
| Amaranthus               | .. .. . | 15                     |
| Bendai                   | .. .. . | 116                    |
| Clusterbeans             | .. .. . | 107                    |
| French Beans             | .. .. . | 1                      |
| Brinjal seeds            | .. .. . | 17                     |
| Snakegourd               | .. .. . | 1—4                    |
| Ribbed gourd             | .. .. . | 0—8                    |
| Dolicas lab Lab 269      | .. .. . | 2—1                    |
| Cowpea new era           | .. .. . | 23                     |
| Tomato—American Marglobe | .. .. . | 2—9                    |

| <i>Seeds.</i>              |    |    |    |    | <i>Quantity<br/>in pounds.</i> |
|----------------------------|----|----|----|----|--------------------------------|
| <b>9 Green Manure—</b>     |    |    |    |    |                                |
| Sesbania                   | .. | .. | .. | .. | 30                             |
| Sunnhemp                   | .. | .. | .. | .. | 685                            |
| Gliricidia                 | .. | .. | .. | .. | 228                            |
| <b>II Plants—</b>          |    |    |    |    |                                |
|                            |    |    |    |    | <i>Quantity in number.</i>     |
| <b>1 Lemon plants—</b>     |    |    |    |    |                                |
| Acid lime seedlings        | .. | .. | .. | .. | 154                            |
| Citron cuttings            | .. | .. | .. | .. | 121                            |
| Citrus Hawaii              | .. | .. | .. | .. | 2                              |
| Malta lemon cuttings       | .. | .. | .. | .. | 119                            |
| Sevilli lemon cuttings     | .. | .. | .. | .. | 123                            |
| Lucknow lemon cuttings     | .. | .. | .. | .. | 17                             |
| Napali round cuttings      | .. | .. | .. | .. | 1                              |
| <b>2 Mango grafts—</b>     |    |    |    |    |                                |
| Alphanso                   | .. | .. | .. | .. | 54                             |
| K. 11/13                   | .. | .. | .. | .. | 6                              |
| Neelam                     | .. | .. | .. | .. | 130                            |
| Padiri                     | .. | .. | .. | .. | 92                             |
| Jahangir                   | .. | .. | .. | .. | 5                              |
| Himayudin                  | .. | .. | .. | .. | 151                            |
| Bangalora                  | .. | .. | .. | .. | 79                             |
| <b>3 Sapota grafts—</b>    |    |    |    |    |                                |
| Cricket ball sapota        | .. | .. | .. | .. | 5                              |
| Kirthabarthi               | .. | .. | .. | .. | 2                              |
| <b>4 Other plants—</b>     |    |    |    |    |                                |
| Rose plants                | .. | .. | .. | .. | 148                            |
| Jasmine cuttings           | .. | .. | .. | .. | 46                             |
| Croton cuttings            | .. | .. | .. | .. | 116                            |
| Chekkurmanis..             | .. | .. | .. | .. | 567                            |
| Jack graft                 | .. | .. | .. | .. | 1                              |
| Delonix regia              | .. | .. | .. | .. | 12                             |
| Passion cuttings           | .. | .. | .. | .. | 50                             |
| Ceylon spinach             | .. | .. | .. | .. | 100                            |
| Pomegranate                | .. | .. | .. | .. | 1                              |
| <b>5 Green manure—</b>     |    |    |    |    |                                |
| Gliricidia seedlings       | .. | .. | .. | .. | 35,700                         |
| Gliricidia rooted cuttings | .. | .. | .. | .. | 4,200                          |
| Ipomea cuttings            | .. | .. | .. | .. | 200                            |
| <b>6 Tapioca setts—</b>    |    |    |    |    |                                |
| Valenca Tapioca seed setts | .. | .. | .. | .. | 25,400                         |
| <b>7 Green slips—</b>      |    |    |    |    |                                |
| Napier                     | .. | .. | .. | .. | 3,300                          |
| Thin Napier                | .. | .. | .. | .. | 500                            |
| Guinea                     | .. | .. | .. | .. | 5,250                          |
| Wates grass                | .. | .. | .. | .. | 600                            |

| <i>Seeds.</i>            |    |    |    |    | <i>Quantity<br/>in cents.</i> |
|--------------------------|----|----|----|----|-------------------------------|
| <b>8 Paddy seedlings</b> |    |    |    |    |                               |
| TKM. 6                   | .. | .. | .. | .. | 8                             |
| PLR. 2                   | .. | .. | .. | .. | 1                             |
| ADT. 12                  | .. | .. | .. | .. | 1                             |
| ADT. 3                   | .. | .. | .. | .. | 1                             |
| GEB. 24                  | .. | .. | .. | .. | 1                             |
| Co. 25                   | .. | .. | .. | .. | 10                            |
| Co. 2 ..                 | .. | .. | .. | .. | 10                            |

*Agricultural Research Station, Nanjanad.*

1. *Season.*—The year under report recorded a rainfall of 81.69 inches on 106 rainy days as against 62.88 inches on 91 rainy days respectively. The first appearance of ground frost was noticed on average for the past ten years. The south-west monsoon started in all its vigour from the first week of June and was active throughout. The distribution of north-east monsoon rains was very adequate, and this has resulted in producing a satisfactory crop during the autumn season. The heavy showers received during the south-west monsoon and north-east monsoon has resulted in producing a good crop of potatoes during the winter (irrigated) crop season of this year. The total precipitation during the period has been very much above the average for the past ten years.

The maximum and minimum temperatures during the period under report ranged between 82°F to 54°F and 68°F to 36°F respectively. The first appearance of ground frost was noticed on 20th November 1959 while the last day of frost was on 20th February 1960.

2. *Crops—A. Potato—(1) Seed Multiplication.*—The variety Great Scot which is the most popular and extensively cultivated potato variety was raised over an area of 34.81 acres during the three crop season. The summer, autumn and winter crops recorded an acre yield of 10,982 lb., 10,179 and 13,387 lb. respectively.

*B. Green Manures—Lupins.*—The crop of Lupins for seed was raised over an area of 22.44 acres. The total yield of seeds obtained during the year was 6,762 lb. and this works out to an acre yield of 301 lb. An area of 13.85 acres of lupins was sown for green manure to precede the autumn and winter crop of potatoes and this yielded 5,000 lb. and 6,500 lb. of green leaf per acre respectively.

*C. Vegetables.*—An area of 0.65 acre was planted with vegetables like cabbage and french beans. A quantity of 9 lb. of french beans and 497½ lb. of cabbage was obtained and distributed.

3. *Seed Supply—(i) Potato.*—A total quantity of 77,744 lb. of disease free Great Scot seed was transferred for multiplication in

the State seed farms and distribution to the ryots. The approximate area covered by the seeds will be about 55 acres and an increased production of 87 tons will be obtained from this area at the rate of increased production of 2½ tons per acre and the total value of this extra yield obtained by the growers is estimated at Rs. 5,100 at the rate of an increased value of Rs. 100 per ton not accounting for similar extra profits due to its further natural spread.

(ii) *Lupins*.—An extent of about 100 acres would have been covered with the seeds distributed for use as green manure for potatoes. Taking the average increase output of potatoes at 2½ tons per acre due to green manuring the extra output of potatoes is estimated to be 5,00,000 lb.

(iii) *Economic Plants*.—A total quantity of 11,550 bluegum seedlings was sold to the public during the vanamanotsava celebrations.

4. *Tree Planting*.—A total quantity of 3,050 bluegum seedlings was planted in the station along the boundary and over steep uncultivated slopes; these seedlings are making steady progress.

5. *Publicity and Propaganda*—(i) *Exhibitions*.—The station participated in the Annual Flower Show at Ootacamund and the Fruit Show at Coonoor. Besides, exhibits were sent to over 22 exhibitions held all over the State and exhibitions were arranged at this station during the visit of very important persons. Exhibits were sent for the World Agricultural Fair at New Delhi and the All-India Mango Show held at Madras.

(ii) *Publications*.—Five articles were published in various media like the Madras Agricultural Journal and the Mezhielvam and in addition five articles have been submitted for publication.

6. *Works*.—The construction of an additional manure pit to meet the increased needs of organic manure was undertaken and completed during the period under report. Besides, special repairs to the existing manure pit and the implement shed was undertaken. The construction of the road from Nanjanad village to Agricultural Research Station, Nanjanad, is in progress. Annual repairs to residential and non-residential buildings and the farm road inside the farm were attended to.

7. *Research Potato*—(i) *Manurial Experiments*—(a) *Studies on the comparative merits of different green manures for potatoes*.—The trials have shown that buckwheat as a green manure for potato is promising and by virtue of its short duration, buckwheat is to be recommended for cultivation preceding the autumn crop of potatoes and lupin for cultivation as a green manure preceding the summer crop of potatoes.

(b) *Observational trial on the interaction between the quantity of fertilizer applied and seed size on the yield of potatoes*.—The observational trial laid out during the summer and autumn crop seasons during 1959-60, has revealed that maximum yield can be obtained using seeds of nearly 2.0 to 2.5 ounces and manured with 2,750 lb. of fertilizer mixture per acre. Hence, the trial favoured the use of large sized seed potatoes and manured with a large dose of fertilizer for producing maximum yields.

(ii) *Cultural experiments*—(a) *Depth of cultivation experiment*.—This trial was laid out in a modified manner using single bullock ploughs to bring about the required depths of cultivation. The yields obtained from various treatments were not significant, but cultivation to a depth of four inches gave maximum yields. The trial is being continued in 1960-61.

(b) *Integrated trial on seed size, seed spacing and row spacing*.—The results obtained during the period under report, favours the use of a seed size of 2.0 ounces and a seed spacing of 6 inches and a row spacing of 12 to 16 inches in and between rows respectively to produce maximum yields. In the autumn crop season, when the crop is raised mainly for seed purposes the use of large sized seed tubers with a close spacing tends to produce more seed tubers, besides increasing the yield.

(iii) *Varietal trials*—(a) *Yield trial—Comparative yield trial with new varieties against Great Scot*.—The variety Bencruachen has once again recorded significantly higher yields over Great Scot, thus confirming the findings of the previous years.

#### *Agricultural Research Station, Bhavanisagar.*

1. *Season and rainfall*.—Rainfall received during the period under report was just above the average. A total of 31.45 inches of rain distributed in 49 rainy days, was received during the fasli year as against 24.77 inches received in 36 rainy days during last year. The average rainfall for the last nine years was 26.39 inches in 42 rainy days. During the south-west monsoon period a total of 9.58 inches distributed in 22 rainy days was received. The rains received during June, July though favourable for ploughing and sowing, the droughty weather that prevailed for about two weeks after sowing was responsible for the failure of cumbu as a whole and cholam in about 10 acres. The rains received during August and September were a little helpful for the groundnut and cholam crop in rainfed areas, whereas in garden-land, crops like cholam and cumbu were severely affected during the north-east monsoon. During the north-east monsoon period a total of 14.77 inches in 18 rainy days was received. During the hot weather period, a total of 7.16 inches of rain spread over nine rainy days was received. This is just below the normal rainfall. The rains received during April and May were harmful to the standing paddy crop when it



was in flowering stage, but other crops like cholam, cumbu and groundnut were benefited. It was also beneficial for taking up preparatory cultivation for green manure sowing.

2. *Reclamation and layout operations.*—The reclamation work in the station was completed during the preceding years. An extra area of about two acres was brought under paddy cultivation. The fields that were newly brought under paddy cultivation are 99-A, 98 and 126. Roughly about 1,600 feet length of gaps in different places of the existing livefence was resown with *Prosopis Juliflora* during the monsoon periods. The existing irrigation channels were repaired and the bunds strengthened to the extent of about 3,000 feet as annual maintenance work.

3. *Field experiments and investigations.*—The following experiments were conducted during the year on various crops under the project conditions as planned in the three-year programme of the station :—

- (i) Rotation experiment to assess the best two-year rotation of crops.
- (ii) Methods of soil amendment to find out the optimum dose of organic manures for cotton and millets.
- (iii) Variety of legumes suitable to the tract as green manure.
- (iv) Dose of organic matter experiment with different doses of green manure leaves for cotton and millets.
- (v) Varietal trials with different crops to fix the most suitable strains for both the seasons of the project area.
- (vi) Time of sowing experiments with cotton millets and oilseeds to determine the optimum periods of sowing under project conditions for getting higher yields.
- (vii) Spacing trials with groundnut and gingelly to determine the optimum spacing for economizing seed rate and getting good yields.
- (viii) Mixed cropping trials to find out the most suitable and profitable mixture of crops for good monetary returns compared to pure crops.

The findings from the field experiments are as follows :—

(i) *Rotation experiment.*—The first year of the third cycle of rotation was completed during the year and the yields were recorded. The costs of cultivation for different treatments were also recorded. Final information will be available only when the crops in the second year of the rotation are completed.

(ii) *Method of Soil Amendment—Cotton.*—The highest yield of 551 lb. of kapas per acre was recorded by the treatments applied with 7,500 lb. of sunnhemp compost.

*Cumbu and ragi.*—In both cases of cumbu and ragi, the maximum yields of 626 and 1,851 lb. of grain per acre, respectively, were recorded from the treatment applied with 7,500 lb. of sunnhemp compost.

(iii) *Variety of Legume experiment.—Cotton.*—The highest yield of 737.7 lb. of kapas per acre was obtained from the treatment green manured with dewgram. Application of phosphate to the crop was significant over the treatment without phosphate.

*Ragi and cumbu.*—In cumbu, sunnhemp, green manured treatment has given the maximum yield of 424 lb. of grain per acre whereas in ragi, sesbania application has recorded the maximum yield of 1,301 lb. per acre.

(iv) *Varietal trials—(a) Cumbu.*—No variety has given significantly increased yields over local, but Co.2. and X.1. have recorded higher yields than other strains during the second and first seasons respectively.

(b) *Tenai.*—Same strains were tried during both seasons. Though no significant results were obtained during first season, Co.3 has recorded significantly increased yields, though on par with Co.1 and Co.2.

(c) *Cholam.*—No cholam strain raised in the second season has given significant results but, in the first season, Co.18 has given significantly increased yield of 168 lb. or 25 per cent over the local.

(d) *Ragi.*—In the first season Co. 5. Ragi had recorded significantly higher yield than local. The yield of Co.5 was 1,887 lb. per acre.

(e) *Castor.*—The strain TMV. 2 has recorded the maximum yield of 562 lb. per acre.

(f) *Groundnut.*—The trial conducted during the first season indicated that the strain TMV. 3 has recorded the maximum yield of 986 lb. per acre which was significantly superior to other strains. In the second season TMV. 2 groundnut has recorded significantly better yield than other strains with a yield of 1,195 lb. per acre.

(v) *Time of sowing experiment—(a) Cotton.*—The September sown crop of cotton has recorded significantly better yields than late sown crop. The highest yield of 1,164 lb. or 23.3 per cent over general mean was recorded by the treatment 10th September sowing.

(b) *Ragi.*—Significant results were obtained from early sown crop of ragi (i.e.), sown on 10th September which has recorded the maximum yield of 1,801 lb. per acre forming 37.8 per cent over general mean.

(c) *Tenai.*—In this trial neither the strain nor the time of sowing has recorded significant result.

(d) *Cumbu.*—September sown cumbu crop has recorded significantly increased yield of 653 lb. of grain per acre or 74.6 per cent increase over general mean.

(e) *Groundnut*.—Significant results were obtained from spreading and bunch variety of groundnuts raised during the first season. The maximum yields recorded by TMV.4 and TMV.2 strains are 1,611 lb. and 2,507 lb. per acre respectively when sown in the first of July. When sowings are delayed beyond July, corresponding reduction in yield was noticed.

(vi) *Spacing trial*.—Various spacings tried for groundnut during the first and second seasons for spreading and bunch variety of groundnut revealed that spacing of 9 inches by 12 inches and 12 inches by 12 inches for spreading type and 6 inches by 9 inches and 9 inches by 9 inches for bunch variety had recorded significant results with yields of 527 lb., 493 lb., 1,082 lb. and 941 lb. of pods per acre, respectively.

4. *Performance of other crops—Paddy*.—With available wetlands of an area of 1,500 acres various strains of paddy were cultivated in a total area of 29.24 acres during both seasons. The average acre yield obtained was 3,233 lb. A basal dressing of 5,000 lb. of green manure was applied along with 125 lb. of standard mixture I given in a 2 split doses.

*Vegetables*.—Vegetables like brinjal, tomato, bendai, culster beans, chillies, and lab-lab were grown in the station and sold.

*Rainfed areas*.—An area of 110.84 acres of dry land was raised with rainfed crops like cholam, cumbu and groundnut. They had recorded acre yield 100, 50 and 579 lb. respectively. The poor yields were due to failure of monsoon in right time.

*Cotton*.—An area of 22.99 acres was raised with cotton. It recorded an acre yield of 783 lb. of kapas. But the crop suffered to some extent due to the attack of spotted bollworm and wilt. Remedial measures were taken to get rid of these pests and diseases.

*Tobacco*.—Tobacco was raised in an area of 2.95 acres. Timely control measures were taken against pests and diseases. The acre yield obtained was 1,160 lb.

*Millets*.—Cholam, cumbu and ragi were sown in a total area of 121.60 acres. The recorded yield for the above crops were 272, 197 and 1,315 lb., respectively.

*Oilseeds*.—Castor and groundnut were sown under irrigated conditions in an area of 1.50 acres and 28.06 acres respectively. The acre yield of groundnut worked out to 663 lb. and castor to 326 lb.

*Pulses*.—Pulses like redgram and cowpea were grown only as mixed crops with cumbu and groundnut. The crops suffered during the initial growth period due to the prevalence of droughty conditions.

5. *Green Manures*.—A total area of 49.76 acres was raised under sunnhemp, both in garden lands and wet lands. Out of this 7.67 acres were set apart for seed production alone. Total green leaf production amounted to 338,505 lb. out of which 54,480 lb. were composted as there was no time for their decomposition in the lands if applied *in situ*. From the area allotted for seed, 10,412 lb. of seed was produced.

(i) *Green leaf manure*.—Gliricidia formed the main green leaf manure trees in the farm. Ipomea leaves were also collected and applied to the fields and composted. A total quantity of 315,000 lb. of green leaf was composted during the year.

(ii) *Farmyard manure*.—A total quantity of 122 tons of farmyard manure was produced during the year.

6. *Vanamahotsava*.—The function was celebrated in this station on 29th August 1959. A total of 30 seedlings of Pungam and many Junbu trees were planted and local officials were the important persons who participated in the function. Besides, gliricidia cuttings and gliricidia seedlings were planted. An area of 1.08 acres was sown with gliricidia seeds for producing gliricidia seedlings at the time of Vanamahotsava celebration during 1960.

#### *Central Farm, Coimbatore.*

*Season and rainfall*.—There was a total rainfall of 31.45 inches on 52 rainy days as against a normal rainfall of 24.71 inches on 47 days.

The south-west monsoon broke out in the second fortnight of July 1959 and the rains were very helpful in taking up sowings of cholam, cumbu and redgram and for preparing nurseries in wet lands. In August there was inadequate rain. During September there was 1.75 inches rainfall and this was conducive to the growth of dry land crops. During the month of August and September the pumpsets were put into full swing for lifting water to garden land crops. The heavy rainfall during November was not favourable for the harvest of Co. 13 and GEB. 24, paddy crop and for the Co. 11, cholam in dry lands and this not only hindered the progress of threshing operations, but also affected the quality of straw and grain. The dry weather prevailed in January facilitated the growth of the irrigated cotton crop and the crop was faring well. This dry weather was also advantageous for harvest of cholam Co. 1, redgram, castor and paddy. The dry weather continued throughout February 1959. In March there was a heavy down-pour of 6.27 inches in 3 rainy days and this caused damage to MCU. 1, late sown irrigated crop and on the other hand the dry land crops were much benefited. With the advent of these summer rains, preparatory cultivation in dry lands, garden lands and in wet lands were taken up. The favourable rains in south-west and north-east monsoon periods induced growth of abundant grass on bunds and also weeds in fields.

Generally the seasonal conditions during the year as a whole were conducive for normal cropping.

**Extent of the farm.**—The total area cultivated during the year excluding orchard and paddocks was 209.56 acres comprising 71.60 acres of dry land, 95.41 acres of garden land and 42.35 acres of wet land. Out of this an extent of 47.61 acres was devoted to experiments and schemes under the different specialists and the rest of the area was utilized for seed multiplication, production of fodder and green manure.

The area under orchard was 9.40 acres and under paddock 19.59 acres.

**Crops grown.**—The main crops raised were paddy, cholam, ragi, cumbu, cotton and fodder crops. Sugarcane, banana and oilseeds, P216F cotton were grown under experiments.

**Paddy.**—Fourteen strains (Co. 1, Co. 2, Co. 13, Co. 19, Co. 25, GEB. 24, ASD. 5, ASD. 11, Cul. 6522, Cul. 6538, MTU. 19, SR. 26 B, BAM 3 and TKM 6) were grown and multiplied in Central Farm and a total quantity of 95,387 lb. of improved paddy seed was produced. Besides this a total quantity of 44,460 lb. of paddy grain (non-seed) was also obtained.

**Cholam.**—Six strains of cholam, viz., Co. 1, Co. 9, Co. 11, Co. 12, Co. 18 and Co. 19 were grown in 38.29 acres and a total yield of 17,283 lb. of seed and 9,472 lb. of grain were obtained. Co. 1, Co. 11 and Co. 19 were harvested for fodder.

**Ragi.**—Four strains of ragi, viz., Co. 1, Co. 2, Co. 5 and Co. 7 were grown in 17.48 acres and a total of 14,403 lb. of ragi seed and 16,046 lb. of grain were obtained.

**Cumbu.**—Two strains of cumbu, viz., Co. 3, Co. 4, were grown in an area of 6.50 acres. The total yield of 2,200 lb. of seed and 958 lb. of grain was produced.

**Cotton.**—MCU. 1. cotton was grown in garden lands on 25.65 acres and total yield of 27,007 lb. kapas was obtained.

P216F cotton was grown in wet lands in rice fallows on 1.00 acre and picking of kapas is still in progress.

KG pandian was grown in dry lands on 15.83 acres and a total yield of 3,046 lb. kapas was obtained.

**Perennial grass.**—Cumbu X Napier grass, Guinea grass and water grass were grown on a total area of 10.46 acres to supply green fodder for the milch animals and young stock. A total quantity of 7,89,964 lb. of grass was obtained.

**Lucerne** was grown on an area of 0.97 acre and a total yield of 14,850 lb. green fodder was obtained.

**Maize** for fodder was grown on 10.02 acres. A total quantity of 1,50,520 lb. succulent green fodder was obtained.

**Pests and diseases.**—There was incidence of jassids and earhead bugs on paddy and these were effectively controlled by dusting with DHC. 10 per cent. Similarly earhead bug of cholam was noted on cholam and this was also controlled by dusting BHC. 10 per cent. In case of cotton MCU. 1, aphids, jassids, leaf roller, boll worms and mites were noted and these were controlled effectively by spraying Paramar 50 per cent. In grapevine, the incidence of downy mildew, powdery mildew and anthracnose were observed and these were effectively controlled then and there. As a sort of prophylactic measure bordeaux mixture 1 per cent was sprayed at periodical intervals. Swabbing with ferrous sulphate was also done to prevent the further incidence of Anthracnose.

**Livestock.**—There were 91 work animals, one breeding bull at the beginning of the year; one animal died while on treatment, 10 animals were auctioned and 10 animals were purchased during the year leaving at the close of the year 93 work animals and one breeding bull.

**Farmer's Day.**—The Farmer's Day was celebrated on 13th September 1959, Sri M. Bakthavathsalam, Minister for Home and Agriculture, inaugurated and Sri R. Krishnasamy Naidu, M.L.A., presided over the function. Exhibits of improved seeds, implements, pesticides and fungicides, fodder grasses and improved methods of cultivation were displayed. Besides the departmental sections, a number of firms, dealing in pesticides and fertilizers, pumpset and electric motors and tractors, took part. Prizes were distributed to the farmers who exhibited their best products. The function was attended by a large number of local agriculturists as well as those from other districts.

**Field Day.**—The Field Day was organized at the Central Farm on 19th January 1960. The agriculturists were taken round the farm and the various improved methods were explained.

**Vanamahotsava and estate planting.**—About 25,000 economic and green leaf yielding plants were raised in the State Nursery for planting in and outside the estate. The old and dead ornamental plants in the estate were periodically replaced. special attention was also given to raising of flowering annuals, and bi-annuals and planting in the important areas of the estate to beautify the areas. Hedges were periodically trimmed, lawns borders and shrubs were properly maintained and the aesthetic appearance was maintained.

**Organic manures.**—About 1,100 tons of farmyard manure was collected and preserved in the proper method during the year.

Further about 160 tons of night soil compost and 110 tons of rural compost were made during the year by making use of all available estate and farm wastes.

Self-sufficiency was attained in regard to green manure requirements of the Central Farm.

**College dairy.**—Though dairy and poultry are run on commercial lines, they were mainly intended for imparting instruction for the student of Agricultural College, and for the young farmers who underwent training. The strength of the herd was 115 at the beginning and at the close of the year it was 112. The change in strength of the cattle was due to 27 calvings and 30 disposals, 12 deaths, 5 auctioned and 13 transferred during the year under report. The breeds maintained were Sindhi, Gir, cross-breeds and Murrah buffaloes.

**Milk herd.**—The average milk yield of the various breeds of cows and buffaloes are furnished below:—

| Serial number and breed. | Average maintained per month. | Average yield per day. |
|--------------------------|-------------------------------|------------------------|
| (1)                      | (2)                           | (3)                    |
| 1 Sindhi Hossur .. .. .  | 4.16                          | 9.0                    |
| 2 Sindhi graded .. .. .  | 10.50                         | 8.9                    |
| 3 Gir .. .. .            | 6.6                           | 10.5                   |
| 4 X-Breed .. .. .        | 8.0                           | 11.7                   |
| 5 Murrah buffalo .. .. . | 4.3                           | 6.5                    |

**Services.**—There is one Gir bull maintained at the Central Farm for the use of breeding Gir cows of the dairy and the bull made 86 services during the year. The rest of the cows were inseminated by artificial insemination.

**More milk.**—The More Milk Day was celebrated at the College dairy on 13th April 1960, i.e., Tamil New Year's day by distributing milk to expectant mothers and poor children in the College estate.

**Poultry.**—At the commencement of the year there were 205 numbers of poultry birds of four breeds. At the end of the year the stock position of the four breeds was 437. There were 458 additions by hatching, and 1 number by purchase. 117 deaths and 110 numbers disposed off by sales and transfers. The breeds maintained were (1) Rhode Island Red, (2) White Leghorn, (3) Barred Plymouth-Rock and (4) Black Leghorn.

**Egg Production.**—There were 31 eggs on stock at the beginning. During the year 12,869 eggs were received and disposed, four thousand, nine hundred and fifty-two numbers by sale for hatching, 6,367 numbers by sale as table eggs, 711 numbers fed to livestock and 765 numbers issued for incubation and balance carried over to the next year was 74. The average egg yield, breedwise is as follows:—

|                             | Average yield per year. |
|-----------------------------|-------------------------|
| Rhode Island Red ... ..     | 114 Nos.                |
| White Leghorn ... ..        | 103 ..                  |
| Barred Plymouth Rock ... .. | 63 ..                   |
| Black Leghorn ... ..        | 119 ..                  |

In the incubation, on an average 52.8 per cent successful hatchings were obtained in 1959-1960 as against 54 per cent successful of hatching during the last year (1958-1959).

**Coconut nursery.**—The administrative control of the coconut nursery continued under the Superintendent, Central Farm. A total number of 23,551 quality, coconut seedlings were supplied to the agriculturists upto the end of the year under report.

**Visitors.**—The Central Farm and the Dairy were visited by a continuous stream of visitors from National Extension Service Blocks, community development centres, Gram sevak Training centres, students from several schools and colleges and numerous agriculturists from various districts.

#### Agricultural Research Station, Kovilpatti.

**Season.**—The period under report recorded a rainfall of 39.49 inches in 59 rainy days as against 28.58 inches in 45 rainy days during the previous year. The rainfed sowing was taken up in time. The cereal crops had an initial set back due to water stagnation, but pulled up well later. Due to heavy and prolonged summer showers of 11.32 inches in 20 days, the Karunganni cotton had rank vegetative growth accompanied by shedding of flowers and bolls in the summer flush. In the rainfed black soil area, 49 acres under cotton K6, 25 acres under Cholam K3, 13.83 and 14 acres under Cumbu K. 1 were grown during the year. The crops recorded normal yield.

**Crops.**—Improvement of the millets, cholam, cumbu, ragi and Kudiraivali and chillies through selection and breeding are the main items of research work at this station. The improvement scheme on chillies is partly financed by the Indian Council of Agricultural Research.

Work on the isolation of bold grained types of the fodder-cum-grain strain, cholam K. 3 is in progress. Intensive selection to isolate a Vellai Cholam strain better than K. 2 was continued. Twelve promising types maturing earlier than K. 2 by 5 to 10 days and with a better yield are in various stages of study. Work on the improvement of the straw quality of Cholam K. 2 by crossing it with Co. 18 is in the F 4 stage. Fifty-four selections with the desirable character combinations are under row yield trials.

Eleven promising single cross hybrids of cumbu await advanced yield tests.

Ragi K. 2 has so far defied all attempts in isolating a better strain. The linkage relation between leaf width and grain shape in ragi was confirmed through back-cross. A cross over value of 10.27 was observed.

Twenty-four promising types of Kudiraivali were compared with local bulk and 14 selections significantly superior to local with 4 to 49 per cent increased grain yield await advanced yield trials.

Two Assam types of chillies recorded 6 per cent and 18 per cent increased yield over local in comparative yield trial. The performance of the types being uniformly good for three years, the better of the two, B72A has been recommended for district trials.

A crop weather scheme to collect the meteorological data is functioning at this station. Routine readings at scheduled hours were made and recorded; soil moisture was done weekly.

*Distribution of improved seeds.*—The following quantities of seeds of improved strains were supplied to the extension staff:—

(a) *Millets*—

|        |      |     |     |     |     |           |
|--------|------|-----|-----|-----|-----|-----------|
| Cumbu  | K. 1 | ... | ... | ... | ... | 3,691 lb. |
| Cholam | K. 2 | ... | ... | ... | ... | 2,137 "   |
| Cholam | K. 3 | ... | ... | ... | ... | 2,869 "   |
| Ragi   | K. 2 | ... | ... | ... | ... | 969 "     |

(b) *Cotton*—

|        |        |     |     |     |     |           |
|--------|--------|-----|-----|-----|-----|-----------|
| Cotton | K.6    | ... | ... | ... | ... | 5,550 lb. |
| Cotton | K. 2   | ... | ... | ... | ... | 57 "      |
| Cotton | MCU. 2 | ... | ... | ... | ... | 2,657 "   |

*Miscellaneous seeds and plants.*—The following quantities of miscellaneous seeds and plants were also supplied to the extension staff:—

(a) *Seeds*—

|                     |     |     |     |     |        |
|---------------------|-----|-----|-----|-----|--------|
| Prosopis juliflora  | ... | ... | ... | ... | 37 lb. |
| Gliricidia          | ... | ... | ... | ... | 9 "    |
| Kapok               | ... | ... | ... | ... | 32 "   |
| Vegetable varieties | ... | ... | ... | ... | 14 "   |

(b) *Fruit plants*—

|                                |     |     |     |     |             |
|--------------------------------|-----|-----|-----|-----|-------------|
| Anab-E-Shahi (rooted cuttings) | ... | ... | ... | ... | 29 Nos.     |
| Nepali lemon layers            | ... | ... | ... | ... | 20 "        |
| Hawai citron layers            | ... | ... | ... | ... | 8 "         |
| Allahabad guava layers         | ... | ... | ... | ... | 8 "         |
| Co. 1 Papaya seedlings         | ... | ... | ... | ... | 10,100 Nos. |
| Kapok seedlings                | ... | ... | ... | ... | 506 "       |

(c) *Grasses and green manure plants*—

|                        |     |     |     |     |             |
|------------------------|-----|-----|-----|-----|-------------|
| A. Guinea grass slips  | ... | ... | ... | ... | 18,000 Nos. |
| Australian grass slips | ... | ... | ... | ... | 4,000 "     |
| Blou Buffel slips      | ... | ... | ... | ... | 50 "        |
| Buffalo grass slips    | ... | ... | ... | ... | 50 "        |
| Kolukattai grass slips | ... | ... | ... | ... | 50 "        |
| Kolukattai grass seeds | ... | ... | ... | ... | 19 lb.      |
| B. Gliricidia cuttings | ... | ... | ... | ... | 10,100 Nos. |
| Ipomea cuttings        | ... | ... | ... | ... | 10,000 "    |

*Sugarcane Research Station, Gudiyat'am.*

*Varietal study plots.*—Thirty-two new Coimbatore varieties of 1959 release were received from the Sugarcane Breeding Institute, Coimbatore and were multiplied for taking over to the varietal study plots.

Seventy-one varieties were under trial in the varietal study plots, under normal conditions of irrigation and manuring for the selection of varieties suitable for the tract and for crushing during the early mid and late season. Based on the yield, juice quality and other economic characters like tillering arrowing, seven varieties, i.e., Co. 1223, Co. 1245, Co. 1248, Co. 1254, Co. 1255, Co. 1260 and Co. 1270 suitable for crushing early in the season and eight varieties, i.e., Co. 1243, Co. 1247, Co. 1252, Co. 1259, Co. 1262, Co. 1271 and Co. 1279 for late season crushing were released and promoted to the next stage of trial namely preliminary yield trial.

In the preliminary yield trial of early varieties, out of the eight varieties under trial none of the varieties proved to be superior to the controls Co. 449 and Co. 527. The six varieties Co. 1166, Co. 1186, Co. 1125, Co. 1152, Co. 1204 and Co. 1201 were selected and are being multiplied for promotion to the next stage of trial. The first of varieties recorded over 40 tons of cane per acre and were all statistically on a par.

In the preliminary yield trial of late varieties, ten varieties were under trial. Though the yield differences were statistically significant the yield of the varieties under trial was generally poor due to the severe drought conditions. Co. 1205 recorded the maximum yield of 30.07 tons, Co. 1169 recorded the best juice quality with 18.29 per cent sucrose and 12.85 per cent C.C.S.

In the main yield trial of early varieties, out of the six varieties under trial compared with Co. 419 and Co. 449, Co. 658 recorded the maximum yield of 45.03 tons. Co. 740 also gave a good yield of 43.18 tons of cane per acre. This is the second year of trial. In the main yield trial of late varieties, four varieties were compared with Co. 419 and Co. 449. The yield differences were not statistically significant. However Co. 1044 recorded the good yield of 40.82 tons per acre as compared to control Co. 419 with only 36.97 tons, Co. 1044 also recorded very good quality with 4.95 tons of C.C.S. per acre as compared to 4.10 in Co. 419.

In the study for the maturity observation of early varieties Co. 740 recorded the maximum sucrose of 19.96 per cent. Co. 785 was the next best with 18.46 per cent sucrose in this month of March. All the varieties attained peak maturity in the month of March and began to deteriorate thereafter except Co. 997 which attained the peak in the month of May with 19.64 per cent sucrose. Co. 740 recorded the maximum C.C.S. of 6.49 tons per acre in the month of March. In respect of jaggery recovery the month of February was found to be the best for good recoveries.

In the maximum observation plots of late varieties, general deterioration in juice quality was noticed in all the varieties beyond March except Co. 1022 where the juice quality was in the trend of improvement. The juice quality in Co. 1044 was also good. The jaggery recovery was also noticed to be good up to the month of March. Juice quality and jaggery recovery was poor in the months of May and June.

In the study on the response of sugarcane crop to phosphate manuring, marked variations like yield, juice quality, jaggery recovery or jaggery quality could be noticed. However among plots manured with phosphates, plots manured with 75 lb. of  $P_2O_5$  all at planting by the natural method of application gave the maximum yield of 50.2 tons per acre. In general all the plots yielded 40 tons of millable cane per acre. The application of 150 lb. of  $P_2O_5$  half at planting and half at earthing-up gave better juice quality.

In the special season trial of sugarcane with Co. 419 and Co. 449 planted in the months of August, September and October and harvested at the stages of 11 to 15 months, it was noticed that Co. 449 recorded better juice quality than Co. 419 in all the three months of planting. There was also improvement in juice quality from 11 to 15 months both in Co. 419 and Co. 449. This is the first year of trial and the trial is being continued to confirm the results.

In this bulk observation plots planted with Co. 419 and Co. 449 to study the yield trend of these two standard varieties, the yield data revealed that Co. 419 recorded an average yield of 37.10 tons and Co. 449, 30.96 tons of cane per acre respectively.

*Miscellaneous.*—In this trials conducted with Co. 419 to study the effect of chemicals on the control of termites, Heptochlor was found to be effective in the control of termites. Similarly, Gama B.H.C. (BC) was found to be effective on the control of early shoot borer of sugarcane. Co. 419 and Co. 449 were planted in 50 cents plot to find the yielding capacity under normal conditions of manuring and cultural operations. Co. 419 yielded 37.10 tons and Co. 449, 30.96 tons.

#### *Rice Research Station, Ambasamudram.*

*Seed multiplication.*—Out of total cultivable area of 25.36 acres in both Kar and Pishanam season, an area of 15.27 acres was planted with bulk for seed multiplication and the rest of the area was planted with experiments. A total quantity of 44,318 pounds of seed paddy was produced at this station. Besides a quantity of 148,982 pounds of grains comprising of mixture paddy and cattle-thrashed paddy was obtained during the period under review.

The station has so far released eleven improved strains of paddy which have covered nearly 80 per cent of the paddy area in the tract with a monetary benefit of about Rs. 1.25 crores a year to the cultivators by way of increased production. One of the strains of the station, viz., ASD 5, is very popular all over the State while others as ASD 1, ASD 3, ASD 8 and ASD 11 are getting popular rapidly in many districts. The strains evolved at this station have given an average 14 per cent increased yield over the unselected ryots' bulk.

Seven hundred and seventy-eight experimental units were planted during the Kar and Pishanam season. These comprised of pure-line selections of Maikuruvai, Seenganni, Arakiravi, Sembuli and other field trials manurial and agrominical experiments. A brief summary of results obtained in the various items of investigation is given below :—

*Pure line selection.*—Two selections in Maikuruvai which recorded 0.81 to 4.1 per cent increased yield over the standard and three selections in Seenganni which recorded 5.1 per cent to 13.6 per cent increased yield over the respective selected bulks were carried forward for further trial. Seven selections in Sembuli and two selections in Arakiravi recorded 5.3 per cent to 15.2 per cent increased yield over the standard were carried forward for further trial.

Among the short duration strains compared in Kar season. Co. 13 gave higher yields than ASD 1 and Chinese variety CA 62 was found to be better than ASD 8. TKM 6 was found to be better than ASD 8. TKM 6 was found to give very low yield when compared to ASD 2 and ASD 7.

Culture 5474 in PTB 15 + GEB 24 was found to be significantly superior to the standard, bulk recording increases in yield ranging from 40 to 70 per cent over ASD 6.

*Summer ploughing experiment.*—In the experiment designed to find out the effect of repeated summer ploughing on the succeeding Kar paddy, it was found that the farm method of raising nursery and transplanting the seedlings recorded 17.02 per cent increased yield over rights' method of broad casting the seed and raising the crop.

*Chinese method of paddy cultivation.*—To find out whether the Chinese method of cultivation will give phenomenal yield as defined by the Chinese report, it was observed that the Chinese method of cultivation is not profitable to the Indian conditions.

*Manurial experiments.*—To find out the differential response of variety to different levels of nitrogen in comparison with potash, it was observed that ASD 1 in Kar and Co. 25 in Pishanam recorded maximum yield. It was also observed that increase in doses of nitrogen resulted in increase yield.

*Fractional application of ammonium sulphate.*—The experiment was laid out to test the methods of application of ammonium sulphate in split doses and different stages of growth in both Kar and Pishanam. It was observed that ammonium sulphate applied in one dose a month after planting has recorded maximum yield in both Kar and Pishanam season.

*Seed treatment with sodium bi-carbonate.*—Steeping the seeds in different strength of sodium bi-carbonate.—Selection for two days prior to sowing did not confer any special advantage nor did they result in increased yields.

Besides the above, 14 different short duration cross progenies of Japonica X Indica were studied in detail. One hundred and sixty-two single plants were selected for further study.

#### *Agricultural Research Station, Paramakudi.*

*Research—Paddy—Introduction and trial.*—The trial conducted under semi dry conditions failed due to absence of rains and absence of irrigation facilities.

*Pure-line selection—Pulithipirati.*—The sixty-six selections though fared well in the beginning of the crop period later suffered at the time of flowering due to low water-level in the tank and absence of rains. Single plants were selected in all the plots for further trial.

*Lulialichan.*—Thirty-two single plants were transplanted under wet condition. Though the general growth and vigour of the crop were satisfactory in the beginning, the stand of the crop after flowering was not satisfactory due to absence of rains. However single plants were selected from all the plots to carry forward next year.

*Banku.*—The trial with 22 selections was a failure when tried under semi-dry condition, when tried under wet condition though the plants came up well in the beginning, the crop died up at the flowering stage due to absence of rains. Hence single plants with good setting in all the plots were selected for continuance.

*Varigarudan samba.*—The yield trial of varigarudan samba with six selections with one standard was not successful due to the unfavourable season. Seed materials were collected for next year's trial.

*Miscellaneous experiments—Seed rate experiment.*—No conclusive results could be obtained as the experimental crop withered due to want of sufficient rains during the growth period.

*Dry land crops—K. 1 Cumbu.*—The crop grown in an area of 40 cents had a growth with satisfactory ear formation. The acre yield of grain obtained was 1,180 lb.

*Co. 2 Cumbu.*—The growth of the crop grown in an area of 41 cents was satisfactory but the ear formation was not better when compared with K.1 cumbu. The acre yield of grain obtained was 625 lb.

*K. 1 Ragi and Co. 1 Ragi.*—The growth of the Co. 1 Ragi crop grown in an area of 26 cents was stunted and gappy as such the crop was ploughed in. The acre yield of K. 1 Ragi grain from the remaining area of 37 cents was only 240 lb.

*K.3 Cholam.*—The Cholam crop was raised in an area of 2.42 acres as first crop and 77 cents as second crop. The average acre yield of grain and straw obtained was 472 lb. and 3,871 lb. respectively.

*Co. 9, Co. 12 and Co. 18 Cholam.*—The Co. 9 and Co. 12 Cholam crop raised in an area of 15 cents each was harvested for fodder purpose as the crop was severely affected with leaf shredding disease. Out of the total area of 1.21 acres under Co. 18 Cholam leaving 71 cents for grains, the crops from 50 cents was cut and stored for fodder. The crop is on the field.

*TMV. 2 Groundnut.*—The TMV. 2 groundnut crop was raised twice in this year. The area under first crop was 1.97 acres and 2.97 acres under second crop. The growth and vigour in the second crop were better when compared to the first crop. The average acre yield of pods in the first and second crop were 655 lb. and 1,240 lb. respectively.

*TMV. 2 and TMV. 3 gingelly.*—An area of 1.37 acres under TMV. 3 and 0.73 acre under TMV. 2 gingelly was grown. The acre yield obtained in TMV. 2 and TMV. 3 were 91 lb. and 135 lb. respectively.

*H. 35 Horse gram.*—The variety H. 35 horse gram was grown in an area of 6 cents. The crop gave an acre yield of 600 lb. grain.

*Varagu trial.*—The trial with Co. 1 varagu, P.1. varagu against the local varagu recorded the superiority of Co.1 varagu over the P.1 varagu and local varagu. The acre yield of Co.1 varagu and local varagu and P. 1 varagu were 732 lb., 632 lb. and 552 lb. respectively.

*Vegetable.*—An area of 25 cents was raised with bendai crop.

*Bendai.*—A total quantity of 105 lb. 11 oz. was obtained during the period under report.

*Snakegourd and bitter gourd crop.*—An area of 6 cents under snakegourd and 3 cents under bitter gourd was raised. The growth of the snakegourd crop was satisfactory. A total quantity of 8 lb. 2 oz. of seed was obtained in snakegourd and 2lb. 8 oz. of bittergourd seed.



**Cluster beans.**—The growth and vigour of the cluster beans crop were satisfactory. The seed production was satisfactory. A total quantity of 108 lb.  $4\frac{1}{2}$  oz. of seed was obtained during the period.

**Fruits and layers.**—A total quantity of 1,015 $\frac{1}{2}$  lb. of fruits comprising mangoes, guava, Malta and seveli-lemon fruits, papaya, etc., 652 numbers of plantain fruits, 1,099 lb. of tapioca tubers were produced and sold. Besides the above, number of Malta lemon and 16 numbers of Jasmine layer were distributed.

**Organic manure.**—A total quantity of 72.29 tons of organic manure comprising of farm yard manure compost and green manure were produced and applied to the field. A quantity of 14.62 tons of green manure was composted in the period.

#### *Pomological Station, Coonoor.*

**Research—(a) Apple.**—Among the new introductions, the variety Rokewood introduced from Auckland during 1951 came to bearing for the first time during the year. The varieties, Laxtons Exquisite and Pigeonette from Auckland, Israel Hybrid type Nos. 1, 3 and 5 selections from Non-Such Estate, Kodeneri Estate, Kodaikanal and Kotagiri, were developing a small crop of fruits for the third year in succession. Giant Jeniton, Parlin's Beauty and Willie Sharp from Auckland continued to bear a small crop of fruit. Multiplication of all the promising varieties was in progress. The quince apple plants planted in 1956 were developing a sparse crop of fruits during the year. In the apple rootstock trial for the variety Rome Beauty with different Merton root stocks and crab, the trees on M. 778 and 779 were observed to lead the rest in the matter of growth and yield. Of the three Malling Merton rootstocks, viz. M.M. 119, 112 and 113, the rootstock of M.M. 112 was observed to be the most vigorous both in respect of growth and sucker production. The observational trial on the propagation of apples by budding will be continued in 1960-61 as soon as the stock materials attain optimum size for operation.

**(b) Plum.**—The variety Purple King from New Zealand continued to bear fruits for the fifth year in succession with an average of 15 fruits and a maximum of 23 fruits during the year. In the rootstock trial for the plum varieties, viz., Czar and Gaviola on seedling rootstocks of plum varieties and common peach, the latter continued to impart greater tree vigour and higher yields than the seedling rootstocks of different plum varieties. However, disparity in stock scion growth was found to be the maximum with the common peach as rootstock for both the varieties. In the trial to break dormancy of shy bearing, late varieties of plum with Sandolin 'A' (0.5 per cent) and Euphyton oil (3 per cent), the observations made during the period confirmed the finding of breaking of dormancy earlier by about 18-22 days in the sprayed trees and also increased yields ranging from 149 to 1206 per cent over the control

under different varieties. A greater increase in yield with shy bearing and self-infertile late varieties of plum such as Shiro and Abundance was also recorded.

**(c) Peach.**—The late variety of peach from Dun Sandle Estate planted at the Station during 1956 was observed to develop a sparse crop of fruits for the third year in succession. In the trial with Red Shanghai and Shanghai Seedling as scion and the three differently aged common peach seedlings as rootstocks; the youngest age-group, viz., eight-month old common peach seedling rootstocks recorded the maximum yield in Red Shanghai, whereas in Shanghai Seedling, the oldest age group, viz., 32 months old stocks recorded the maximum. The cropping of late varieties of peach, in general, was comparatively good presumably due to the rains received during the fruit development stage.

**(d) Pear.**—The variety Kieffer, the only variety which was adjudged to be superior to the tract, was found to carry a moderate crop of fruits whereas the bearing of New Pear was good during the period. Beurre Giffard and Le conte were observed to develop a sparse crop of fruits. The variety Jargonelle emerged out to be superior with its good shape, size and eating qualities. The varieties Beurre Hardy, Marie Lousie, Winter Cole and selections from Kodaikanal and Kallhatti remained to be in the pre-bearing stage.

**(e) Persimmon.**—The varieties, Hachiya and Raw Eating introduced from Kulu Valley, Punjab, and planted at the station during 1956 were observed to carry a small crop of fruit for the third year in succession. Other varieties, viz., Dai Dai Maru, Tenanashi, Unnamed, and *Diospyros lotus* which are in full bearing at the station were observed to develop a moderate crop during the year.

**(f) Cherimoyer.**—In the trial to study the comparative performance of grafts and seedlings of Cherimoyer, the growth measurements recorded during the year continued to reveal the superiority of seedling Cherimoyer in respect of growth while the grafts accounted for better yield. The different selections at the station and the introduction made from the United States of America developed fairly a good crop of fruits during the period.

**(g) New introductions.**—Of the 24 types of vegetable seeds introduced from Srinagar, the Capsicum variety and six types of beans proved to be quite suitable under Coonoor conditions. The performance of strawberry variety, viz., Early Cambridge, Royal Sovereign and Sir Joseph Paxton was comparatively poor during the year. The plants of West Indian Cherry introduced from College Orchard, Coimbatore, were observed to be highly stunted in growth and very sparse in the production of foliage indicating its unsuitability to the tract. Seedlings of *Artimissia pontica*, *Artimisia dracunculus*, *Ammi visnaga* and *Angelica archangelica* were making satisfactory progress.



*Kallar Fruit Station.*

*Research.*—(a) *Annonas*.—During the year nineteen hybrids in four different parental combinations have fruited and the fruits were subjected to organoleptic test and were described. They were found to resemble the female parents in all characters.

In the custard-apple rootstock trial, the Bull's heart rootstock was observed to be the most suitable for the propagation of custard-apple from the point of view of its vigorous-growth habit.

The performance of *annonas*, in general, was not satisfactory during the period under report.

(b) *Citrus*.—Out of the seedlings and clonal progenies of 23 parental types, assembled from representative mandarin orange growing tracts in India, fruit descriptions of 19 selections have been made.

In the rootstock trial a graft of Wynaad mandarin orange on sweet lime rootstock had fruited. The fruits were poor in quality.

In the citrus hybridisation trial three progenies of the combination of Malta Lemon as female and Triumph variety of Grape fruit as male have fruited. None of the progenies is gametic.

(c) *Jack*.—In the rootstock trial, a graft on Rudrakshi rootstock bore fruits for the seventh year in succession and it has been observed to carry an estimated crop of 1,000 lb.

Two hybrids of the combination Singapore Jack × Ordinary Jack and one hybrid of the combination (female) Singapore Jack × Velipala jack fruited during the year. The fruits resembled the female parents.

(d) *Mangosteen*.—The growth performance of the progenies of the seven parental types has been slow.

(e) *Pine-apple*.—A total of 94 flowers were hybridised in the two varieties, viz., Kew and Mauritius. Out of the 98 seeds obtained from the hybridised fruit of (female) Mauritius × Kew, and sown in the nursery, 22 seeds had germinated and the seedlings are under study.

Sixteen seeds were obtained in two fruits that resulted from the cross of Kew and Mauritius and they were sown.

(f) *Patchouli*.—The plants of patchouli grown at Kallar fruit station was analysed and found to contain 3.04 per cent of essential oil. Studies on the propagation with different lengths of shoot cuttings are in progress.

(g) *New introductions*.—The performance of white sapota, *Rauwolfia*, Derris, *Agave sisalana*, Singapore Kapok and African oil palm was satisfactory while *Ammi Visnaga*, Chinese Gooseberry, Tree onion, *Anacyclus pyrethrum* were not successful. Chicory, Coorg acid lime, Meyer lemon, Carica hybrids, Tolu and *Sausaurea lappa* were under study.

*Burliar Fruit Station.*

*Research.*—(a) *Durian*.—The seedlings of *Cullenia excelsa* were observed to be the most vigorous rootstock for the propagation of durian than its own seedlings.

(b) *Jack*.—Out of the 42 selections assembled at the station, the selection from Thyagarayanagar bore fruit for the second year in succession.

In the paragraph trial with growth regulators no successful results could be achieved.

(c) *Passion fruit*.—Hand self-pollination resulted in increase in yields from 66 to 87 per cent in the yellow passion fruit and from 8 to 92 per cent in the gaint passion fruit.

(d) *Pummelo*.—The progress of the progenies obtained by selfing pummelo was satisfactory.

(e) *New introductions*.—The performance of patcholi cardamom cultures from Singampatti, cardamoms from Bombay, *Cinnamomum iners*, menthol and Chicory were satisfactory.

## 15. BOTANICAL GARDENS AND PARKS.

(a) *Enquiries*.—A total of 611 enquiries at the Government Botanic Gardens, Ootacamund, and 595 at Sim's Park, Coonoor, on ornamental gardening and other allied subjects of Horticulture were received and attended to during the period.

(b) *Inspection of private gardens*.—Private gardens belonging to different categories were visited by the technical staff for rendering advice and suggestions for their improvement and better maintenance.

(c) *Meeting and gathering of growers*.—There were no meetings and gatherings of growers during the period. An exhaustive collection of ornamental plants and decoration materials was sent for exhibition in the First World Agricultural Fair, New Delhi, which was held there from December 1959 to February 1960. Decoration materials were also sent to Madras in connection with the Second All-India Mango Show held there during May 1960.

In addition, exhibits from Government Botanic Gardens, Ootacamund and Sim's Park, Coonoor, were also displayed during the annual spring flower show held in the Government Botanic Gardens, Ootacamund, on 16th May 1960, and in the Fruit Show held in the Sim's Park, Coonoor, on 23rd May 1960.

*Research.*—(a) *New introductions*.—Out of a total of thirty-seven kinds of seeds introduced at the Government Botanic Gardens, Ootacamund and Sim's Park, Coonoor, the following are found successful:—

1. American Squash.

2. *Ammi visnaga*.

- |                               |                                   |
|-------------------------------|-----------------------------------|
| 3. <i>Rhododendrons</i> .     | 7. <i>Chicorium intybus</i> .     |
| 4. <i>Lilium nepalenses</i> . | 8. <i>Sausurea lappa</i> .        |
| 5. <i>Lilium gigantum</i> .   | 9. <i>Angelica archangelica</i> . |
| 6. <i>Ferula tingitana</i> .  |                                   |

In addition, several varieties and kinds of bulbous plants like Begonias, Amaryllis, Gladioli, Dahlia, etc., were also collected to enrich the existing stock of these plants.

(b) *Item of research undertaken with a gist of the progress made and results achieved.*—Two items of research were in progress at both the stations for the period ending 31st December 1959.

1. *Investigations into the causes of deterioration in some imported annuals.*—This is a common item of research for both the Government Botanic Gardens, Ootacamund and Sim's Park, Coonoor. At the Government Botanic Gardens, Ootacamund the crops of Cineraria, Schizanthus, Salpiglossis, Sweet peas, Linum, Linaria, Marigold, Candy tuft, Phlox, Petunia, Calendula and Chrysanthemum were raised and characteristics studied in comparison with their previous generation or generations as the case may be. The studies revealed that Cineraria, Schizanthus and Marigold deteriorate in the quality of flowers while Nemesia, Salpiglossis, Gypsophylla, Linum, Linaria and Candytuft did not show any indication of deterioration throughout the period of the trial. The trial in respect of other annuals was not concluded.

At Sim's Park, Coonoor, absence of deterioration was recorded in *Statice sinuate* and *Zinnia liliput* in their first generation after acclimatization, while the result was contrary with *Gaillardia grandiflora*.

2. *Inter-crossing of the imported sweet peas varieties and local Botanical Garden types.*—Description of six varieties of imported sweet-peas and of the ancient fragrant variety available at the Government Botanic Gardens, Ootacamund, was recorded. The flowers of those were selfed and seeds collected. The crops raised from selfed seeds as well as those collected from open pollinated flowers were under observation.

3. *Plant introduction studies.*—This item was put under a regular trial since 1960 and four kinds of seeds were introduced at the Government Botanic Gardens, Ootacamund, till now. Out of these, plants of *Ferula tingitana*, *Chicorium intybus* and *Sausurea lappa* were available for further studies. The seeds of *Quercus suber* failed to germinate

4. *Viability studies in the seeds of annuals and trees.*—The seeds of *Acer oblongum*, *Acacia decurrens*, *Jacaranda mimosaeifolia*, *Frenela rhomboida*, *Eucalyptus citriodora*, *Zinnia double Brench Marigold* and *Dianthus mixed* were sown in monthly batches of one hundred in each batch. From the trial it was found that the later three could be stored for over six months without detriment to viability. The seeds of *Eucalyptus citriodora* and *Jacaranda mimosaeifolia* gave over 70 per cent germination till three months from storage. The viability of *Frenela rhomboida* was below 60 per cent for the same period.

5. *Studies on growth and flowering of orchids.*—The growth and flowering of all orchids included in the trial were studied. The plants of *Dendrobium Densiflorum* and *Epidendrum pseudospidendrum* were found to grow vigorously than other orchids, while the growth of *Coelogyne barbata*, *Cymbidium eburneum* and *Cypripedium insigne* was uniform throughout the period.

6. *Selection and seed or plant multiplication of Begonias and Amaryllis.*—A total of thirty varieties and kinds of Begonias and 24 of Amaryllis were collected from all over the country. Out of these four Amaryllis and five Begonias were described fully to isolate superior ones.

7. *Basic information on growth and flowering in selected plants.*—The usual pruning of roses by the end of February resulted in their blooming after 45 days of the operation. From the observations it was found that rainy weather during their flowering had a retarding effect in roses and that the number and length of new shoots appeared to be correlated to the number and length of old woods which were pruned.

Preliminary observations on growth and flowering of Camellias and Azaleas were in progress.

8. *Selection and multiplication of Dahlias and Gladioli.*—Forty-six varieties of Dahlias and thirty-two of Gladioli were introduced from different nurserymen and their descriptions recorded. The superior varieties isolated from the collection are under multiplication.

9. *Crop sampling surveys on paddy and millets.*—Crop sampling surveys on paddy and millets crops (viz., cholam, cumbu and ragi) for estimating the average yield and production of the crops for the individual districts and the State as a whole were continued during fasli 1369 (1959-60). The survey on statistical assessment of additional production of paddy due to the application of three principal Grow More Food aids, viz., improved (paddy) seeds, green manure, and ammonium sulphate was also continued.

## IX. CROP SAMPLING SURVEYS.

The technical control of the crop sampling work was vested with the Director of Statistics. The field work relating to the experiments on paddy was attended to by the staff of the Agricultural Department and that on millet crops by the Revenue staff except in Kanyakumari district. The work of the field staff in the districts of Chingleput, South Arcot, North Arcot, Salem, Coimbatore, Tanjore, Tiruchirappalli, Tirunelveli and Kanyakumari was supervised by the concerned District Statistical Officers. In the district of Nilgiris, the work was supervised by the District Statistical Officer, Coimbatore, till 31st March 1960 and from 1st April 1960 by the District Statistical Officer posted for that district. The supervision of field work in Madurai and Ramanathapuram districts was attended to by the Special District Agricultural Officer (Crop Sampling), Madurai, till the abolition of this post on 31st March 1960 and from 1st April 1960 by the District Statistical Officers posted for the respective districts.

*Results of the survey on paddy and millets.*—The data collected from the experiments were analysed and the results for the State as a whole in respect of each category of crop are furnished in Appendix 33.

*Grow more food and assessment survey.*—For the survey to assess the additional production due to the application of Grow More Food aids, the total number of experiments planned (under three principal aids) during 1959-60 was 750, out of which 287 were completed satisfactorily. The number of experiments planned and considered for analysis and the rate of response, i.e., additional yield of rice due to the application of each of the three principal Grow More Food aids, viz., improved paddy seeds, green manure and ammonium sulphate are furnished in Appendix 34.

*Crop sampling survey on potato for assessing the effect of terracing.*—In order to estimate the increase in the yield of potato due to terracing, crop cutting experiments were planned to be conducted on potato crop of the March-April season in the Nilgiris district during the year 1959-60 also. Sanction was accorded by the Government for the conduct of 100 pairs of experiments in the villages of Ketty, Nanjanad and Ootacamund and for the appointment of three fieldmen for a period of four months under the Agricultural Demonstrators or Agricultural Extension Officers concerned. Experiments planned to be conducted in the terraced as well as non-terraced plots (control plots) were completed under the supervision of the District Statistical Officer, Coimbatore, who was in charge of Nilgiris district and from the data collected, the difference in the average yield was estimated as 3,285 lb./acre or 3,682 kg Hect.

*Crop sampling surveys on cotton, sugarcane and groundnut.*—Crop sampling surveys on cotton, sugarcane and groundnut for estimating the average yield per acre and the total outturn of each

crop for individual districts and the State as a whole, were conducted in the fasli year 1369 (1959-60).

*Results on the Surveys on Cotton, Sugarcane and Groundnut.*

The results of the surveys are given below :—

| Category of crops.         | Number of experiments. |                          | Estimated average yield in lb./acre. |                                | Percentage of sampling error. | Production in '000 tons.      |
|----------------------------|------------------------|--------------------------|--------------------------------------|--------------------------------|-------------------------------|-------------------------------|
|                            | Planned.               | Considered for analysis. | (4)                                  | (5)                            |                               |                               |
| (1)                        | (2)                    | (3)                      | (4)                                  | (5)                            | (6)                           | (7)                           |
| 1 Cotton                   | 650                    | ..                       | ..                                   | ..                             | ..                            | ..                            |
| Madras American            | ..                     | ..                       | ..                                   | ..                             | ..                            | ..                            |
| Cambodia.                  | ..                     | ..                       | ..                                   | ..                             | ..                            | ..                            |
| (i) Irrigated              | ..                     | 25                       | 220                                  | 246.59<br>Kg./<br>hectare.     | ..                            | ..                            |
| (ii) Unirrigated           | ..                     | 20                       | 110                                  | 123.29<br>Kg./<br>hectare.     | ..                            | ..                            |
| Madras American            | ..                     | ..                       | ..                                   | ..                             | ..                            | ..                            |
| Uganda—                    | ..                     | ..                       | ..                                   | ..                             | ..                            | ..                            |
| (i) Irrigated              | ..                     | 8                        | 340                                  | 381.09<br>Kg./<br>hectare.     | ..                            | ..                            |
| (ii) Unirrigated           | ..                     | 10                       | 180                                  | 201.75<br>Kg./<br>hectare.     | ..                            | ..                            |
| Karunganni (improved)      | ..                     | 52                       | 80                                   | 89.67<br>Kg./<br>hectare.      | ..                            | ..                            |
| Karunganni (ordinary)      | ..                     | 12                       | 40                                   | 44.83<br>Kg./<br>hectare.      | ..                            | ..                            |
| 2 Sugarcane                | 360                    | 236                      | 32.98<br>(in tons/<br>acre).         | 82.80<br>(tonnes/<br>hectare). | 2.46                          | 4,390.3<br>(4,460.76<br>tons) |
| 3 Groundnut (unirrigated), | 550                    | 184                      | 746<br>(in lbs/<br>acre).            | 836.15<br>(Kg./<br>hectare).   | 15.93                         | *                             |

(1) The yield of sugarcane is in terms of cane.

(2) The yield of groundnut is in terms of unshelled nuts.

## X. PROPAGANDA. DEMONSTRATION AND PUBLICITY.

*Propaganda.*—The Agricultural Extension staff intensified their propaganda and demonstrations for increased production under the "Grow More Food" and other schemes like cotton extension, sugarcane development and oil seeds development. Special emphasis was laid on the Japanese method of paddy cultivation, sinking of filter points and tube-wells, intensive manuring

\* not estimated, as estimated unirrigated area under groundnut is not available.

of paddy and sugarcane, green manuring with *Sesbania* and other green manures, organising Village Seed Farms for paddy millets. The extension staff constantly toured the villages and contacted villagers individually and collectively.

**Demonstration plots.**—To make propaganda effective and to serve as ocular demonstrations, demonstration plots were laid out to bring out the effects of improved seed, better varieties and cultural practices, optimum doses of manures and the use of improved implements and machinery. A total of 145,493 demonstrations were conducted in all.

Special efforts were made to lay demonstration plots on the Japanese method of paddy cultivation and about 51,118 such demonstration plots were conducted attaining the target of at least one plot for each village in the State.

**Agricultural Associations.**—For popularizing the agricultural improvements agricultural associations were formed in various villages and the members were induced to adopt all the improved practices for increasing production. During the year 10,668 new associations were formed and a total of 13,603 associations were functioning in the State.

#### AGRICULTURAL INFORMATION.

The Agricultural Information Service Unit was started in January 1957, with the idea of effectively disseminating the results of research in Agriculture and Animal Husbandry in the language of the farmer in simple, precise and clear language carrying simple messages to the farmer in a catchy and impressive way.

The following number of folders, leaflets, booklets, posters and flash cards were printed and distributed :—

|             | Nos.    |
|-------------|---------|
| Folders     | 10,000  |
| Leaflets    | 227,500 |
| Booklets    | 52,000  |
| Posters     | 39,500  |
| Flash Cards | 135,000 |

The Agricultural Information Officer gave lectures in the meetings of progressive farmers and toured the Community Projects and National Extension Service blocks and gave training to village level workers in the best methods of extension work. He assisted in the conduct of the Regional Seminar on Soil Testing and conducted In-services Training Classes at Madurai for Grama Sevaks, maistries, fieldmen and Agricultural Extension Officers.

First Regional Agricultural Information Workshop Seminar was conducted at Kodaikanal. The Minister for Agriculture inaugurated the Seminar. Dr. Leagons and M. G. Kamathi, Production Specialist, Government of India, New Delhi, have attended the seminar and gave instructions on how to prepare

Agricultural Information materials for extension work. Thirty-seven visual aid materials were prepared during the seminar.

The propaganda van moved in different parts of the State for agricultural propaganda purposes. The films on Japanese method of paddy cultivation were distributed to all District Agricultural Officers for propaganda purposes.

About 20,610 copies of Grow More Food Journal "Mezhichelvam" were printed every month and distributed. Twenty-five thousand copies of the Villagers' Guide and calendar were also printed and distributed to the departmental officers for effecting local sales. About 34 exhibitions were conducted throughout the State with a view to giving wide publicity about the departmental activities.

**Radio talks.**—The following Radio talks were delivered through All-India Radio by departmental officers :—

| Name of the officer.                                                             | Subject.                                                          | Station.                         | Date.            |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------|------------------|
| (1)                                                                              | (2)                                                               | (3)                              | (4)              |
| 1 Sri A. Venkataraman, District Officer, (South).                                | Green Manure (Tamil).                                             | All India Radio Tiruchirappalli. | 12th March 1960. |
| 2 Sri A. Venkatesan, I.A.S., Director of Agriculture, Madras.                    | Our achievements under the Second Five-Year Plan (English).       | All India Radio Marina, Madras.  | 5th March 1960.  |
| 3 Sri V. Ramalingam, Journal Assistant.                                          | Rajya Munnetram Agriculture Programme for the Third Plan (Tamil). | Do.                              | 9th March 1960.  |
| 4 Sri C. R. Seshadri, Joint Director of Agriculture, (Planning and Development). | Development of Commercial Crops in Madras State (English).        | Do.                              | 21st May 1960.   |
| 5 Sri V. Ramalingam, Journal Assistant.                                          | Agricultural Extension (Tamil).                                   | Do.                              | 8th June 1960.   |

**Seed multiplication—Paddy and millets.**—The multiplication and distribution of improved strains of paddy and millets evolved at the Breeding stations continued to be the most important item of work of the Agricultural Department. The improved strains to be multiplied are raised first in the Agricultural Research Stations and then in the Government State Seed Farms. Primary Seed Farms are also run wherever necessary. Then the produce obtained from the State Seed Farms are given to the Village Seed Farm ryots for further multiplication and distribution to other ryots in the village. There is a planned programme for one-third coverage of improved seeds in each village for each crop under the Village Seed Farm Scheme in every district. The progress and conduct of this scheme is being watched carefully by the technical staff of the district.

The achievements made during the fasli year 1959-60 under this scheme for the distribution of improved seeds of paddy and millets are given below :—

|                       | TONS.  | LB.   |
|-----------------------|--------|-------|
| Paddy (P) .. .. .     | 2,317  | 554   |
| Paddy (VSF) .. .. .   | 25,784 | 815   |
| Millets (P) .. .. .   | 228    | 1,056 |
| Millets (VSF) .. .. . | 2,527  | 1,647 |

*State Seed Farms.*—Under the Second Five-Year Plan, it was originally targetted to open 360 State Seed Farms of 25 acres each under the scheme for opening of State Seed Farms in Madras State for multiplication and distribution of improved seeds of paddy, millets, etc. Later it was decided to have only 210 farms in this State on the recommendations of the Committee on Agricultural Production based on the area of crops in the State.

The scheme commenced during the year 1956-57. Every year, some farms were opened. Based on actual experience it was found that some of the sites selected for this purpose suffered from one drawback or another and rendered the farms unsuitable for continuance. Such farms were closed after gaining some experience. During the years 1956-57 to 1959-60 (up to 30th June 1960), 212 farms were opened and 85 farms were closed. Thus on 1st July 1960 there were only 127 farms functioning in this State.

*Japanese method of paddy cultivation.*—During fasli year (i.e., from 1st July 1959 to 30th June 1960) an area of 1,730,149 acres was covered under Japanese method of paddy cultivation.

Japanese method of paddy cultivation comprising of the following five major items of improvements, viz., (1) seed treatment, (2) line planting, (3) optimum manure dosage, (4) inter-cultivation and (5) plant protection is slowly gaining ground. It is becoming increasingly popular among the ryots. No separate staff is available at present for this scheme. Still the propaganda work is being carried out by the District Agricultural Officers with the existing staff.

*Cotton—Development.*—The following seed multiplication schemes were in progress :—

*MCU. 1 Scheme.*—The object of the scheme is to distribute 18,000 bags of pure seeds to the Central districts in order to step up the quality of irrigated cotton grown in the State to full one inch staple thereby reducing the necessity to import cotton from foreign countries. For this purpose, seed farms are raised over an area of 6,000 acres every year. The seed farms are organized in two centres, namely, Tiruppur and Coimbatore at 2,000 and 4,000 acres respectively.

The particulars of procurement and distribution of seeds are furnished below :—

| Procurement of seeds. |                                                                                                                    |                                       |           |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------|
| Name of the centre.   | Source.                                                                                                            | Bags of 100 lb.                       | Total.    |
| (1)                   | (2)                                                                                                                | (3)                                   | (4)       |
| 1 Coimbatore ..       | Nominees .. .. .<br>Cotton Breeding Station and Central Farm.<br>Intensive Khadi Scheme ..<br>Central Jail .. .. . | 7,942·00<br>71·55<br>356·00<br>821·00 | 9,190·55  |
| 2 Tiruppur ..         | Seed Farm Ryots' Association.<br>Nominees .. .. .<br>Jails .. .. .                                                 | 3,893·00<br>1,300·00<br>624·96        | 5,817·96  |
| Total ..              |                                                                                                                    |                                       | 15,008·51 |

#### Distribution of seeds.

| Serial number and particulars.  | Centre.                             |                                   | Total.    |
|---------------------------------|-------------------------------------|-----------------------------------|-----------|
|                                 | Coimbatore, in bags of 100 lb. net. | Tiruppur, in bags of 100 lb. net. |           |
| (1)                             | (2)                                 | (3)                               | (4)       |
| 1 Seed Farm Sowing .. .. .      | 678·43                              | 541·95                            | 1,220·38  |
| 2 State Seed Farms .. .. .      | 35·99                               | ..                                | 35·99     |
| 3 Sales, etc. .. .. .           | 0·03                                | 2·61                              | 2·64      |
| 4 Cotton Extension Plan .. .. . | 8,477·00                            | 5,273·40                          | 13,750·00 |
| Total ..                        | 9,190·55                            | 5,817·96                          | 15,008·51 |

*K5 Cotton Scheme.*—The K5 Cotton Scheme aims at the upgrading of rain-fed cotton in the State. For this purpose, seed farms over 20,000 acres are organized and the demand of the ryots for improved rain-fed cotton seeds, is met with. The seed farms were organized in four centres, i.e., Palladam, Suler, Udumalpet and Perianaickenpalayam at 5,000 acres at each centre.

The particulars of procurement and distribution of seeds are furnished below :—

| Procurement of seeds.                       |           |            |                |          |
|---------------------------------------------|-----------|------------|----------------|----------|
| Serial number and sources.                  | Centre.   |            |                | Total    |
|                                             | Palladam. | Udumalpet. | Suler. (bags). |          |
| (1)                                         | (2)       | (3)        | (4)            | (5)      |
| 1 Intensive Khadi Scheme ..                 | 598·50    | ..         | 733            | 1,321·50 |
| 2 Nominees .. .. .                          | 3,102·00  | 1,024      | 1,880          | 6,006·00 |
| 3 Cotton Breeding Station and Central Farm. | 19·55     | 3          | 26             | 48·55    |
| Total ..                                    | 3,710·05  | 1,027      | 2,639          | 7,376·05 |

*Distribution of seeds.*

| Serial number and particulars. | Palladam. | Sulur. | Udumil-pet. | Peria-naicken palayam. | Total.   |
|--------------------------------|-----------|--------|-------------|------------------------|----------|
| (1)                            | (2)       | (3)    | (4)         | (5)                    | (6)      |
| 1 Cotton extension plan ..     | 1,666.00  | 1,183  | 697         | ..                     | 3,546.00 |
| 2 Seed farm sowings ..         | 1,150.05  | 1,148  | 1,030       | 500                    | 3,828.05 |
| 3 Sales, etc. ..               | 2.00      | ..     | ..          | ..                     | 2.00     |
| Total ..                       | 2,818.05  | 2,331  | 1,727       | 500                    | 7,376.05 |

*Disbursement and recovery of to Seed Farm advances.*—The disbursement of Seed Farm advance is made in two instalments—one as seeds before sowing and the second in cash after sowing to meet the cultivation expenses. The seeds are distributed in August, September for MCU. 1 and in September and October for K5. schemes. The cash advance is disbursed in November–December for MCU. 1 Scheme and in December–January for K5. Scheme. The recovery is made in the marketing season, i.e., March to July for MCU. 1 and April to September for K5. cottons.

The following table shows the particulars of Seed Farm advances disbursed during 1958–59 season, the amount collected during 1959–60 out of the said amount and the amount disbursed during 1959–60 for recovery during 1960–61 :—

| Serial number and particulars.       | Amount.         |              |
|--------------------------------------|-----------------|--------------|
|                                      | MCU. 1. scheme. | K.5. scheme. |
| (1)                                  | (2)             | (3)          |
|                                      | RS. NP.         | RS. NP.      |
| 1 Amount disbursed during 1958–59 .. | 1,30,753.78     | 2,44,770.71  |
| 2 Amount recovered ..                | 1,28,670.20     | 2,40,856.14  |
| 3 Balance ..                         | 2,083.58        | 3,914.57     |
| 4 Percentage of recovery ..          | 98.4            | 98           |
|                                      | per cent.       | per cent.    |
| 5 Amount disbursed during 1959–60 .. | 1,52,282.44     | 2,53,448.04  |

The recovery of amount disbursed in 1959–60 season, will be made before the end of September 1960.

*Multiplication and distribution of K2. and MCU. 2 seeds.*—(a) *Seed Farm arrangement—Karunganni.*—An extensive area of 31,268 acres (K2. 17322 and K6. 13946) was sown under seed farm conditions during 1959–60 season, for multiplying the K2. and K6. seeds, achieving 103 per cent of targetted area.

*Uganda.*—A total area of 6,396 acres was sown under MCU. 2 during 1960 summer against the targetted area of 6,000 acres.

Thus, the targets for organizing seed farms under improved strains of Karunganni and Uganda cottons have been exceeded.

(b) *Procurement and distribution—Karunganni-2.*—A total quantity of 11,164 bags (112 lb.) of good viable seeds was procured (1958–59 season) on the basis of germination test. Out of this, a quantity of 8,319 had been supplied to the Cotton Extension Scheme and a quantity of about 2,333 bags was reserved for seed farm sowings.

*Karunganni-6.*—A quantity of 1,668 bags (112 lb.) was procured and the entire quantity was issued to ryots under seed farm conditions for further multiplication.

*Madras Cambodia Uganda-2.*—From the 1959 crop a quantity of 9,494 bags of good viable (98 lb. each) seeds was procured on the basis of viability. Out of this a quantity of 7,668 bages was distributed under the Cotton Extension Scheme and a quantity of 1,826 bags was distributed to the ryots for seed farm sowings.

(c) *Issue of seed farm advances and recovery of arrears.*—During the period under report a sum of Rs. 3,86,566 was disbursed as cultivation advances to the seed farm ryots of both Karunganni and Uganda zones. A total amount of Rs. 5,34,913 has been recovered including old arrears from the ryots during the period.

From the inception of the scheme (1950–51) a total sum of Rs. 38,79,031 was issued to seed farm ryots (of K2. and MCU. 2 zones) as seed and cultivation advances and a substantial amount of Rs. 36,76,940 had been recovered so far, working to a recovery of 94 per cent.

*Extension of area under cotton.*—As per the latest Forecast Report on cotton for the Madras State, an area of 875,100 acres have been raised under cotton up to 25th January 1960 as against 820,000 acres for the corresponding period of last year, showing an increase of 1.4 per cent in cotton area. This increase is mainly due to the high ruling prices for cotton and the extensive propaganda done under the Cotton Extension Scheme.

*Procurement and distribution of improved strains.*—The present cultivated improved strains in Madras State are MCU. 1, MCU. 2 and P. 216F belonging to American uplands and K2, K5 and K6 coming under rain-fed desi. The seeds of these improved strains are being procured through the Seed Multiplication and Distribution schemes functioning in the State.

Quantities of improved seeds targetted for distribution during 1959–60 season and those actually procured and distributed are furnished below :—

| Serial number and name of strain. | In Bengal maunds of 82.2/7 lb.       |                    |                       |
|-----------------------------------|--------------------------------------|--------------------|-----------------------|
|                                   | Quantity targetted for distribution. | Quantity procured. | Quantity distributed. |
| (1)                               | (2)                                  | (3)                | (4)                   |
| 1 MCU. 1 .. ..                    | 20,400                               | 13,875             | 16,875                |
| 2 MCU. 2 .. ..                    | 9,300                                | 9,132              | 9,132                 |
| 3 P. 216 F. .. ..                 | 2,000                                | 1,688              | 1,609                 |
| 4 K 2. .. ..                      | 12,000                               | 11,138             | 11,138                |
| 5 K 5. .. ..                      | 7,140                                | 4,310              | 4,310                 |
| Total, 1959–60 ..                 | 50,840                               | 43,143             | 43,064                |
| Total, 1958–59 ..                 | 39,200                               | 33,984             | 33,984                |
| Increase over 1958–59 ..          | 11,640                               | 9,159              | 9,080                 |

On account of the absence of timely rains in both the winter and summer seasons, the crop yields were reduced. Further, in parts of Coimbatore district wherefrom the MCU. 1 seeds are procured, the winter sown Cambodia crop was seriously affected by jassids, boll-worms and stem-weevil. The P. 216F cotton crop raised in summer in Tiruchirappalli district was also affected by jassids and aphids. Further, the prevalence of drought has reduced the yields of rain-fed cottons and summer Cambodia markedly. Hence, only 43,143 maunds of improved seeds could be procured against the targetted quantity of 50,840 maunds. Still the total quantity of seeds procured and distributed during the year has exceeded the previous year by 9,159 maunds.

*Achievements of area and production under the Cotton Extension Scheme.*

| Particulars.                        | Area in acres. |              | Estimated additional production in bales. |              |
|-------------------------------------|----------------|--------------|-------------------------------------------|--------------|
|                                     | Target.        | Achievement. | Target.                                   | Achievement. |
| (1)                                 | (2)            | (3)          | (4)                                       | (5)          |
| <b>A. Extension of area—</b>        |                |              |                                           |              |
| 1 Reclamation of fallows ..         | 10,000         | 16,920       | 2,500                                     | 4,230        |
| 2 Replacement of other crops ..     | 57,000         | 31,098       | 28,500                                    | 15,549       |
| 3 Double cropping ..                | 73,500         | 47,778       | 36,750                                    | 23,889       |
| <b>B. Extensive cultivation—</b>    |                |              |                                           |              |
| 1 Inter-cropping ..                 | 80,000         | 57,344       | 10,000                                    | 7,168        |
| 2 Use of Improved seed ..           | 3,67,500       | 3,11,216     | 14,700                                    | 12,450       |
| 3 Application of fertilizers ..     | 2,14,000       | 1,38,016     | 26,750                                    | 17,252       |
| 4 Plant protection ..               | 4,80,000       | 3,25,040     | 6,000                                     | 4,188        |
| 5 Improved cultural practices ..    | 64,000         | 2,99,120     | 800                                       | 3,739        |
| <b>Total production in bales ..</b> |                |              | 126,000                                   | 88,465       |

The achievement under the improved cultural practices has exceeded the target. The procurement of MCU. 1, MCU. 2 and P. 216F cotton seeds was below expectations on account of unfavourable seasonal conditions. The sale of K5. seeds could not be pushed through on account of seeds sold by cotton merchants to their customers. Further, the sale of seeds on loan basis by the merchants attracts the poor class farmers and to this extent the use of departmental seed is reduced. The merchants and mill owners did considerable propaganda for selling their so-called 9030 G and K6. seeds. The growers purchased large quantities of such seeds in preference to departmental MCU. 1, K5. and K2. seeds. This affected the sale of departmental seeds of MCU. 1, K5. and K2. and the coverage under departmental seed to a large extent. The shortage of fertilizers in the market and the unfavourable season have restricted the application of fertilizers to cotton. There was

scarcity of pesticides like "Folidol" in the month of November when the winter sown American cotton needed the Plant Protection measures. Further, the extent of plant protection depends on the severity of damage caused to the cotton crop by insect pests and diseases. The main reasons for the short-fall in achievement in other measures of improvement were (1) late receipt of rains in the unirrigated Cambodia and Central Karunganni tracts, (2) untimely heavy rains in the Southern summer Cambodia zone resulting in the diversion of a part of the area under summer cotton for raising a second crop of paddy and (3) prevalence of drought and lack of irrigation facilities in the Central and Northern districts of the State. However, the estimated additional production during the year has exceeded the production of last year by 10,971 bales.

*Oilseeds development.*—To step up production under oilseeds the following schemes were in operation:—

I. Scheme for the development of oilseeds within Five-Year Plan.

II. Extension scheme for the increased production of oilseeds in the irrigation project areas outside the Five-Year Plan.

III. The scheme to run four Zonal Nucleus Seed Farms of groundnut and castor.

IV. The scheme for crop yield competition for groundnut.

V. The scheme for the free distribution of castor seeds.

**I. THE SCHEME FOR THE DEVELOPMENT OF OILSEEDS WITHIN SECOND FIVE-YEAR PLAN.**

*Object of the scheme.*—This scheme aimed at an additional production of 70,000 tons of oilseeds namely, groundnut, gingelly and castor by the end of the Second Five-Year Plan period which terminates on 31st March 1961. This additional production was proposed to be achieved through the following three measures:—

1. Spread of improved strains.
2. Intensive cultivation measures.
3. Extension of area under oilseeds.

*Achievements during the year.*—

(a) *Spread of improved strains Quantity of seeds procured and distributed.*

| Serial number and name of the crops. | Target in maunds. | Procurement in maunds. | Distributed in maunds. |
|--------------------------------------|-------------------|------------------------|------------------------|
| (1)                                  | (2)               | (3)                    | (4)                    |
| 1 Groundnut .. ..                    | 24,000            | 3,952                  | 3,840                  |
| 2 Gingelly .. ..                     | 1,500             | 55                     | 133                    |
| 3 Castor .. ..                       | 600               | 173                    | 44                     |

## (b) Progress of Seeds Farm work—Seed Farms organized.

| Serial number and name of the crop. | Primary seed farm. |              | Secondary seed farm. |              |
|-------------------------------------|--------------------|--------------|----------------------|--------------|
|                                     | Target.            | Achievement. | Target.              | Achievement. |
| (1)                                 | (2)                | (3)          | (4)                  | (5)          |
| 1 Groundnut .. ..                   | 840                | 389          | 4,200                | 1,842        |
| 2 Gingelly .. ..                    | 780                | 233          | ..                   | ..           |
| 3 Castor .. ..                      | 1,560              | 383          | ..                   | ..           |

## (c) Additional production achieved during the year.

| Serial number and item of improvement. | Target.   |        | Achievement. |        |
|----------------------------------------|-----------|--------|--------------|--------|
|                                        | Area.     | Tons.  | Area.        | Tons.  |
| (1)                                    | (2)       | (3)    | (4)          | (5)    |
| 1 Spread of improved strains.          | 409,170   | 22,508 | 276,238      | 17,429 |
| 2 Intensive cultivation .. ..          | 383,270   | 16,997 | 378,024      | 17,837 |
| 3 Extension of area .. ..              | 215,490   | 31,375 | 121,805      | 36,640 |
| Total .. ..                            | 1,007,930 | 70,880 | 176,067      | 71,906 |

The achievement under total production exceeded the target during the year 1959-60 due mainly to extension of area.

## II. SCHEME FOR EXTENSION OF OILSEEDS CROPS IN THE IRRIGATED PROJECT AREAS IN MADRAS STATE OUTSIDE THE SECOND FIVE-YEAR PLAN.

*Object.*—The object of the scheme was to achieve an increased production of 96,000 tons of oilseeds in the project areas by the end of Second Five-Year Plan period.

*Sphere of operation.*—It is proposed to work the scheme in project areas of Lower Bhavani, Cauvery, Mettur, Manimuthar and Amaravathi, Sathanur and Krishnagiri project area were also added during the year.

*Work done during 1959-60 under the scheme.*—The scheme was implemented on 1st January 1958 and the achievements are furnished in the statement below :—

## (a) Quantity of seeds procured and distributed during 1959-60.

| Serial number and crop. | Target. | Procurement in maunds. | Distribution in maunds. |
|-------------------------|---------|------------------------|-------------------------|
| (1)                     | (2)     | (3)                    | (4)                     |
| 1 Groundnut .. ..       | 5,600   | 1,540                  | 1,070                   |
| 2 Gingelly .. ..        | 400     | 90                     | 68                      |
| 3 Castor .. ..          | 400     | 76                     | 90                      |

## (b) Details of primary and secondary seed farm arranged.

| Serial number and name of the crops. | Target in acres. |            | Attainment. |            |
|--------------------------------------|------------------|------------|-------------|------------|
|                                      | Primary.         | Secondary. | Primary.    | Secondary. |
| (1)                                  | (2)              | (3)        | (4)         | (5)        |
| 1 Groundnut .. ..                    | 700              | 2,800      | 241         | 1,250      |
| 2 Gingelly .. ..                     | 200              | ..         | 188         | 81         |
| 3 Castor .. ..                       | 800              | ..         | 342         | 340        |

## (c) The additional production achieved under scheme cropwise

| Serial number and name of the crops. | Target.       |                     | Achievement.  |                     |
|--------------------------------------|---------------|---------------------|---------------|---------------------|
|                                      | Area covered. | Production in tons. | Area covered. | Production in tons. |
| (1)                                  | (2)           | (3)                 | (4)           | (5)                 |
| 1 Groundnut .. ..                    | 277,000       | 75,100              | 187,456       | 43,593              |
| 2 Gingelly .. ..                     | 116,500       | 6,625               | 48,676        | 2,921               |
| 3 Castor .. ..                       | 71,000        | 2,925               | 33,755        | 1,632               |

## III. THE SCHEME FOR RUNNING THE FOUR ZONAL NUCLEUS SEED FARMS OF GROUNDNUT AND CASTOR IN MADRAS STATE.

*The object of the scheme.*—The object of the scheme was to multiply and distribute on a large scale improved strains of groundnut and castor on Zonal Basis for further multiplication in the State Seed Farms and Primary Seed Farms in ryots holding and distribution in various districts.

*Technical programme.*—Under the scheme it was proposed to multiply the four strains of groundnut, namely, TMV. 1, TMV. 2, TMV. 3 and TMV. 4 and one strain of castor, namely, TMV. 2 and issue for sowing primary seed farms for further multiplications. The total area of the Zonal Nucleus Seed Farms and the area devoted for each strain is furnished in the table below :—

|                  | Total<br>extent. | Groundnut. |        |        |        | Castor. |
|------------------|------------------|------------|--------|--------|--------|---------|
|                  |                  | TMV. 1     | TMV. 2 | TMV. 3 | TMV. 4 | TMV. 2  |
| Area in acres .. | 200.00           | 56.00      | 49.00  | 80.00  | 5.00   | 10.00   |

Target and achievements : As against a target of 135,175 lb. of oilseeds 83,173 lb. of seed were procured and distributed as detailed below :—

|                                | Groundnut. |        |        |        | Castor. |
|--------------------------------|------------|--------|--------|--------|---------|
|                                | TMV. 1     | TMV. 2 | TMV. 3 | TMV. 4 | TMV. 2  |
| 1 Target for the year 1959-60. | 51,000     | 17,500 | 60,900 | 3,375  | 2,400   |
| 2 Achievement during 1959-60.  | 15,839     | 21,785 | 42,692 | 1,627  | 1,230   |

The seeds were distributed to sow an area of 1,700 acres of Primary Seed Farms.



## IV. SCHEME FOR THE CROP YIELD COMPETITION FOR GROUNDNUT.

*Object of the scheme.*—The object of the scheme was to create a competitive spirit among the groundnut growers in producing the highest yield by adopting the improved methods of cultivation and thereby contributing to the over all production of groundnut in the State.

*Work done during the year.*—As against a target of 1,500 competitors, 2,190 entrants were enlisted of those only 149 Plots were successfully harvested. Final selection of winners has not yet been made.

## V. SCHEME FOR THE FREE DISTRIBUTION OF CASTOR SEEDS TO THE CULTIVATORS.

*Object of the scheme.*—The object of the scheme was to popularise the practice of mixed cropping of castor with other crops so that the area under castor can be increased considerably.

It is also proposed under the scheme to induce the ryots to grow castor on contour bunds, waste areas, canal and Railway embankments and inferior lands.

During 1959-60, a sum of Rs. 5,000 was sanctioned by the Committee to purchase and distribute 20,000 lb. of castor seeds. But actually 17,892 lb. of castor seeds were purchased at a cost of Rs. 5,000 and distributed.

A total number of 1,909 ryots was benefited since the inception of the scheme and an additional area of 7,014 acres were brought under the crop.

*Cashewnut development*—1. *Selection of parent trees.*—A total of 608 parent trees were selected in six plantations in Pan-ruti and Gandharvakottai areas during the 1960 season as against 434 trees in the 1959 season. The trees have been selected on basis of high yields, desirable tree and nut characters and freedom from pests and diseases.

2. *Procurement of seednut.*—A total quantity of 12,800 lb. of seeds was procured from the marked, parent trees during the year for distribution to the cultivators, both under the Loan scheme and for general planting.

3. *Loan work.*—During the year 1959-60 season, long-term-loans were sanctioned as follows.—

|                                  |                |
|----------------------------------|----------------|
| Number of cultivators .. .. .    | 158            |
| Amount of loan disbursed .. .. . | 51,860 rupees. |
| Area covered .. .. .             | 650 acres.     |
| Seed distributed .. .. .         | 1,950 lb.      |

*Sugarcane development.*—The Sugarcane Development Scheme was in operation in Nellikuppam, Villupuram, Vridhachalam and Kallakurichi taluks of South Arcot district, Ambur, Tirupattur and Gudiyatham taluks of North Arcot district, Mannargudi taluk of Tanjore district, Madurantakam and Chingleput taluks of Chingleput district, Kulittalai and Karur taluks of Tiruchirappalli district, Nilakottai taluk of Madurai district, Tiruchengode taluk of Salem district, Udumalpet, Diarapuram and Coimbatore taluks of Coimbatore district. There were four Special Demonstrators for Seed Nursery Works with headquarters at Cuddalore, Vellore, Karur and Coimbatore.

Each unit was in charge of a special Agricultural Demonstrator assisted by a fieldman and four demonstration Maistries. The development work in the districts of Tanjore, South Arcot and Chingleput was in charge of the Cane Development Officer, Madras and that in the districts of Tiruchirappalli, Salem, Coimbatore and Madurai was under the Cane Development Officer, Tiruchirappalli.

The staff visited the cane growers frequently and advised them on improved methods of cane cultivation, arranged for short crop nurseries and for the requirements of tractors and other implements, manures, fertilizers and pesticides for cane growers. Demonstration Plots on varietal, cultural and manurial aspects were laid out.

*Preparatory cultivation.*—The development staff advocated the advantages and usefulness on thorough preparation of land to attain good cane crops. During the year 26,345 acres were worked with iron plough and 22,243 acres worked with ridge plough. Use of tractor for ploughing and trenching has become very popular especially in factory areas.

*Seeds and sowing.*—The importance of raising of short crop nurseries for getting pure, healthy and disease free sets was stressed among the growers and 3,232 acres of nurseries were raised.

The nurseries were raised mostly with the varieties Co. 419, Co. 449, Co. 527, Co. 658 and Co. 785.

From the short crop nurseries raised last year large areas were covered with pure, healthy and disease free setts. Further, the Cane Development Staff assisted the ryots in selecting pure, healthy and disease free setts from plant crop also and in all 24,581 acres were planted with selected seed material. Financial assistance was given to the ryots by way of premium to nurserymen who raised short crop nurseries for seed purposes and transport subsidy to those ryots who planted pure, healthy and disease free seed materials from such nurseries. The total amount disbursed

under the subsidy scheme being Rs. 2,94,921. Twenty six thousand two hundred and eleven acres were planted under proper spacing and 26,049 acres with optimum seed-rate.

**Manures and Manuring.**—Two to three hundred pounds of nitrogen were applied in the factory areas and in other gur areas quantities ranging from 100 to 200 lb. were applied. The need for application of optimum quantity of concentrates at the optimum time was stressed among the growers. A total of 1,009 manurial demonstration plots were laid out in the Cane Growers' holding to bring out the advantages of intensive manuring. The ryots who had laid out typical manurial demonstration plots as per departmental recommendations were paid a cash subsidy of Rs. 50. The total amount spent on this account was Rs. 13,000.

By intensive propaganda by the Cane Development Staff, 38,349 acres were manured with the optimum quantity of concentrates within the optimum time, 8,189 acres were intersown with green manure and 12,484 acres were manured with outside green leaves. Under the Intensive Manuring Scheme for sugarcane, 29,748.62 acres were covered and a loan amount of Rs. 15,34,032 was disbursed for purchase of manures and fertilizers.

Press mud was used with great advantage as manure for sugarcane and rotational crops.

**Cane trash compost.**—Cane ryots were advised to compost cane trash which is generally used as fuel and as roofing material. Though the gathering of cane trash and composting is laborious and costly its incorporation is very useful in maintaining soil fertility. Trash compost pits numbering 1,231 were dug in the different centres. In the Tiru Arooran Sugar Factory area, the cane trash was mulched in alternate rows in the ratoon crops and this operation was carried out over 2,250 acres utilizing nearly 6,760 tons of cane trash compost.

**Pests and Diseases.**—Among the diseases smut was the most widely present for the reason that the most popular variety Co. 419 is susceptible. Sustained propaganda was done by the Staff for raising short crop nurseries for getting pure, healthy and disease free setts, selection of pure, healthy and disease free setts from plant crops, roguing out smutted clumps and reduction of areas under second and subsequent ratoons. The eradication of smutted clumps was done in 16,788 acres.

Pine apple and mosaic were reported in stray cases.

Among the pests early shoot borer is the most serious pest followed by top borer and internode borer. The development staff advocated partial earthing up in the early stages against

early shoot borers and also spraying with chemicals. Partial earthing up was done in an area of 18,575 acres and spraying with chemicals in 13,979 acres.

The development staff recommended the application of 10 per cent BHC. dust in furrows at 20 to 30 lb. per acre against termites.

Another important item of plant protection work done during the year was pretreatment of setts with Aretanan organo mercuric compound. This was largely done in factory areas and setts to cover 9,800 acres were pretreated before planting.

During the year the pesticides were ordered to be sold at fifty per cent concessional rate throughout the year for sugarcane crop instead of the previous practice of restricting such concessional sale only to areas declared as "Pest affected".

One "Aspee" model power sprayer was purchased during the year for hiring out to sugarcane ryots.

**Training of technical personnel.**—The special staff engaged in cane development work were given technical training at the Central Sugarcane Research Station, Cuddalore, for two months. Three batches were given training during the year, training in all three special Agricultural Demonstrators, eight Fieldmen and 42 Demonstration Maistries.

**Work in gur centres.**—In the gur areas the development work mainly consisted in the demonstration of use of improved furnaces, improving the extraction percentage of juice, use of wide and shallow pans and the demonstration of preparation of good quality jaggery with the use of proper clarificants. During the year 1842 demonstrations of construction and repairs of improved furnaces and 1,641 demonstrations of preparation of good quality paggery were conducted.

**Sugarcane Zonal Farm, Rajadhanikottai (Madurai district).**—This zonal farm started in the year 1957 was continued to be maintained. During the year, varietal, manurial and cultural trials for the main season and for the special season were conducted. Co 419 cane recorded the maximum yield of 38.20 tons of cane per acre. Trials conducted with varying doses of nitrogen revealed that even though there were increases in yields these increases were not commensurate with the increases in the dose of nitrogen and that the quality of juice decrease with increased doses of nitrogen.

**Sugarcane Zonal Farm, Lakshmanagudi (Tanjore district).**—This farm was also started during the year 1957. In manurial trials conducted during the year, it was revealed that 350 lb. of N per acre gave the maximum yield per acre. In the yield trials among the early varieties Co. 951 recorded the highest yield of 32 tons

per acre. Among late varieties Co. 785 recorded the highest yield of 41.3 tons per acre. In the Factory Bye-Products trials no difference in yields was noticed between the different treatments. In the Irrigation Trial yield in four irrigation plot proved better than two irrigation plot.

*Road Development scheme in the sugar factory areas.*—The roads leading to the sugar factories in the State are in many cases not quite fit for transporting sugarcane quickly from the ryots fields to the factories. Any delay in the transport of cane from the field to the factory will result in cane drying up with consequent loss to the ryot and also national loss in the shape of less recovery percent of sugar. A scheme for the development of roads in sugar factory areas has therefore been included in the Second Five-Year Plan.

2. During the period 1st April 1959 to 31st March 1960, a sum of Rs. 7.19 lakhs was spent towards formation and development of twenty-nine miles six furlongs of road and construction of eighteen culverts in the Nellikuppam-Pugalur, Pandiarajapuram, Ambur and Pettavaithalai Sugar Factory areas.

*Sugarcane cess.*—The rate of cess on sugarcane crushed in sugar factories continued to be at Rs. 2 per ton during the period under report. The cess was collected from the five sugar factories. At the close of financial years 1958-59 there was a closing balance of Rs. 30.70 lakhs in Sugarcane Cess Fund. During the financial year 1959-60 a sum of Rs. 17.30 lakhs was collected by way of cess.

*Utilization of cess fund.*—The State Government's share of expenditure on the Sugarcane Research and Development Schemes during 1959-60 was met from the cess fund as follows:—

|                                                               | Lakhs. |
|---------------------------------------------------------------|--------|
| 1 Sugarcane Research Scheme .. .. .                           | 2.20   |
| 2 Sugarcane Development Scheme .. .. .                        | 3.10   |
| 3 Scheme for Establishment of Zonal Farms .. .. .             | 0.19   |
| 4 Scheme for Extension Work on Sugarcane Insect Pest Control. | 0.08   |
| 5 Scheme for Development of Roads in Factory areas ..         | 5.48   |
| 6 Scheme for Improvement of Gur Manufacture and Storage.      | 0.63   |
| 7 Scheme for Soil Survey and Classification of cane tracts.   | 0.11   |
| Total ..                                                      | 11.27  |

*Manures—Cattle manure.*—The importance of proper preservation of Farm Yard Manure and augmenting its supplies was stressed.

*Composts—Urban compost.*—For increasing the manurial resources converting all organic wastes into compost was stressed. The scheme is run by 66 Municipalities and 261 notified Panchayats besides the Corporation of Madras, Mettur, Courtallam and Bhavanisagar Township Committees.

A quantity of 361,386 tons of compost was produced during the year as against 323,392 tons produced during 1958-59. There has been an increase of 37,994 tons of compost. A quantity of 313,260 tons was distributed during 1959-60 as against 314,635 tons during 1958-59.

The following concessions were granted for the sale of compost:—

(a) Loss incurred in the sale of compost is subsidised by Government in cases where the compost was sold at Rs. 2 per ton fixed by Government.

(b) *Sale of compost was exempted from sales tax.*—Government sanctioned a scheme to popularise the application of compost to crops. Accordingly the following centres Tuticorin, Tiruchirappalli, Davakottai, Karaikudy, Mayuram, Dindigul, Nammakkal, Kallakurichi, Ariyalur and Tiruchendur were selected where the off-take of compost manure was found poor for demonstrating the value of compost and compost reinforced with super in the cultivators field on the model of Indian Council of Agricultural Research trials.

The experiments were conducted under the guidance of Field Manure Officers and District Agricultural Officers successfully in the five centres, viz. Mayuram, Ariyalur, Nammakkal, Tiruchengode and Tuticorin. In other centres the trial was restricted due to want of rains in time and during the growth period of the crop. From the results of the successful experiments it is seen that maximum increase was obtained in most of the centres where super-reinforced compost with and without addition of ammonium sulphate was used.

A sum of Rs. 2.11.499 was granted to Municipalities and Panchayats towards loss incurred on account of the sale of compost manure at the rate of Rs. 2 fixed by Government.

*Green manures.*—Great emphasis was laid on the growing of green manures and applying green leaves for augmenting the manurial resources of the State. Growing of green manures like Daincha, Kolinji, Indigo, Pillipesara, Sunnhemp and Sesbania was popularised. To give an impetus for the growing of green manures, and to green manure the lands, the following concessions are given to ryots.

(i) Green manure seeds are sold at 80 per cent of the all-in-cost in non-block areas and at 50 per cent of the all-in-cost in Block areas.

(ii) Cultivation advances ranging from Rs. 10 to Rs. 15 are also paid to the ryots to grow green manure crops under seed farm conditions.

(iii) A subsidy of Rs. 2 per manud of green manure seeds produced and delivered is also paid to the cultivators as premium. The expenditure is met by Government of India in full.

During the period from July 1959 to June 1960, a total quantity of 1,328 tons of green manure seed was distributed by the Department.

*Fertilizer distribution.*—The purchase and distribution of straight (pooled) fertilisers are under the control of the Board of Revenue, Madras and are distributed to the public through the distributors selected by the Collectors and co-operative societies. The allocation and supply of fertilisers made by the Government of India are not adequate to meet the actual requirements of the State. In order to accelerate food production and to meet the requirements of the various crops and soil conditions four standard mixtures have been prescribed. The mixtures are in large demand and are being sold to public at fair prices.

*Loans.*—To popularize the off-take of the straight fertilizers short-term loans to the extent of Rs. 750 on personal surety and Rs. 1,500 with additional surety are being granted by Government under the Intensive Manuring Scheme. Government have also extended the grant of short-term loans under Intensive Manuring Scheme for the purchase of Standard mixtures I to IV.

*Fertiliser Demonstration Scheme.*—The Free Fertiliser Demonstration Scheme in cultivators' fields has been in vogue since 1954. In this scheme, the Government of India, in co-operation with the Technical Co-operation Mission of the United States of America initiated a large scale programme of Fertilizer Demonstration in 1954, and this is being continued annually on an extensive scale. The objective of these demonstrations is to demonstrate to the cultivators the efficiency of the chemical fertilisers in increasing crop production, and also to acquaint them with some of the new fertilisers likely to be produced in the country, like urea ammonium sulphate nitrate, calcium ammonium nitrate, etc. The fertilisers for the demonstrations were supplied free of cost by the Technical Co-operation Mission in the first year, 2/3 in the second year and 1/3 in the third year. From 1957-58 onwards the fertilisers are being supplied free of cost by the Government of India to all State Governments.

The following fertilisers were supplied free of cost during 1959-60 for both the Khariff and Rabi seasons.—

Urea, ammonium sulphate nitrate, calcium ammonium nitrate, mixed fertiliser No. I (12-6-6) mixed fertiliser No. II (12-6-6) and mixed fertiliser No. III (12-6-12).

A large number of demonstrations is conducted every year in a limited area for each in the ryots fields so that they themselves may be convinced of the efficiency of the chemical fertilisers in increasing crop production and become fertiliser minded.

During the year 1959-60, 8,851 demonstration plots were laid out in the Fertiliser Demonstration Scheme in all the districts in the State covering various crops and covering all types of demonstrations.

In all these demonstrations, manured plots have always given higher yields than the untreated plots.

These demonstrations have made the ryots fertiliser minded and general complaint among the cultivators is that they do not get adequate supply of chemical fertilisers for application to their crops in time.

*Scheme for control of pests and diseases of crops.*—The Plant Production Staff in the districts continued to do propaganda for adoption of prophylactic measures against pests and diseases of crops which take a heavy toll of the crops every year. They also helped the ryots in tackling the pests and diseases of crops.

*Diseases of crops.*—During the year under report, there were no major outbreaks of any serious diseases of crops in an ephytiotic scale. However sporadic occurrences of blast, helminthosporium and stem rot of paddy, blast of ragi, leafspot of banana, fruit rot and die back of chillies and various other diseases of different crops were reported from different districts and these were kept under effective control by taking timely control measures by the Plant protection staff. During the year, several concessions were given to the cultivators to serve as an inducement to them to come forward to take up control measures freely, particularly those poorer sections who could ill afford to do so otherwise. The following concessions were in force during the year.

(i) Pesticides were sold at half cost for all the food crops throughout the year in all areas.

(ii) Two thousand four hundred and fifty-five hand-operated sprayers were purchased and sold to the cultivators at half cost during the year.

(iii) Pesticides were sold to the cultivators at half cost for oil seed crops other than coconut during the year in Coimbatore district.

(iv) Pesticides to the tune of Rs. 1,000 was distributed at half cost to betelvine growers in Salem district.

(v) Pesticides to the tune of Rs. 25,000 has been sanctioned to be sold for sugarcane crop at half cost throughout the State.

(vi) A special scheme with a Special Plant Protection Assistant and other staff was functioning during the year in Coimbatore district for the control of pests and diseases of oil-seed crops alone.

Full advantage of all the above concessions was being availed of by the cultivators and the response has been very good.

Seed treatment to ward off seed borne diseases of crops like paddy, cholam, sugarcane, cotton and groundnut was also intensified and larger areas were covered by treated seeds, thereby ensuring freedom from seed borne diseases. A mass scale prophylactic Plant Protection Scheme to demonstrate the benefits of prophylactic measures to the cultivators was in operation during the period. This scheme had very good publicity value and the ryots in the nearby locality were greatly benefited by the results by way of educating themselves, on the Prophylactic Plant Protection methods.

Several other diseases affecting various other crops such as turmeric, betelvine, sugarcane, cotton, groundnut, arecanut, coffee, tea, potato, cabbage, onion, tomato, grapes, banana, citrus, coconut, tobacco, peas, brinjal, acid lime and mango were also effectively tackled during the period under report. Particulars relating to the incidence of various diseases and the remedial measures adopted for their control are furnished in Appendix 23.

*Incidence of pests on crops.*—Unusually this year, there was a very severe outbreak of green jassids on paddy in Chingleput, South Arcot, North Arcot, Salem, Tiruchirappalli and Ramanathapuram districts. During 1949 such an outbreak was experienced and this seems to be a recurrence after a lapse of ten years. The next pest of importance was the paddy stemborer. The cholam earhead bug was also noticed in a severe form in all cholam growing districts. Aphids, Surulpoochi and the Red hairy caterpillar on groundnut appeared on extensive areas. Incidence of pests on cotton were also widespread. The other pests were observed in varying degrees. Particulars of incidence of various pests on crops and remedial measures adopted are furnished in Appendix No. 23.

*Crop Yield Competitions.*—(a) Crop yield competitions were held for stimulating a lively interest among the growers and increasing the acre yield of crops. The crop yield competitions for paddy which was started in 1950-51 was continued during the year.

The competitions covered all varieties of paddy grown under any

system of cultivation throughout the State and prizes were awarded from the firka level onwards in non-development areas and from village level in Community Development and National Extension Service areas.

(b) The crop competitions were also organized in respect of other crops like cholam, cumbu, potato, groundnut and sugarcane in the following areas:—

*Cholam.*—Coimbatore, Madurai and Tiruchirappalli.

*Cumbu.*—Coimbatore, Tiruchirappalli and Ramanathapuram.

*Potatoes.*—The Nilgiris.

*Groundnut.*—South Arcot, North Arcot, Salem, Coimbatore, Chingleput, Madurai, Tirunelveli, Ramanathapuram, Thanjavur and Tiruchirappalli.

*Sugarcane.*—Sugar factory areas in South Arcot, North Arcot, Tiruchirappalli, Madurai and Thanjavur.

(c) The total number of competitors enlisted and the highest yields obtained are given below in respect of the competitions for 1958-59 which were finalized during the year.

| Name of the crop. | Number of competitors enrolled. | Highest yield per acre. |
|-------------------|---------------------------------|-------------------------|
| (1)               | (2)                             | (3)                     |
| Paddy .. .. .     | 10,482                          | 8,300 lb.               |
| Cumbu .. .. .     | 248                             | (Not yet finalized)     |
| Cholam .. .. .    | 508                             | 6,040 lb.               |
| Potato .. .. .    | 158                             | 14,800 „                |
| Sugarcane .. .. . | 530                             | 145 tons and 2,222 lb.  |
| Groundnut .. .. . | 1,712                           | 4,980 lb. per acre.     |

*Celebration of more milk day.*—In pursuance of the orders issued in G.O. Ms. No. 1263, Food and Agriculture, dated 2nd April 1960 the staff of this department took part in the celebration of the 'More Milk Day' organized by the Collectors and the local milk unions in the districts on 13th April 1960, the Tamil New Years Day and delivered lectures on the importance of milk and methods of increasing the milk production.

The surplus milk available at the Agricultural Research Station, Kovilpatti and at the Agricultural College Dairy, Coimbatore, were distributed free to children on that day:—

| Name of station.                                  | Quantity distributed. | Value.  |
|---------------------------------------------------|-----------------------|---------|
| (1)                                               | (2)                   | (3)     |
|                                                   | LB.                   | RS. NP. |
| Agricultural Research Station, Kovilpatti .. .. . | 6½                    | 1 32    |
| Agricultural College Dairy, Coimbatore .. .. .    | 10                    | 2 50    |

## XI. VANAMAHOTSAVA.

The tenth Vanamahotsava celebrations were celebrated throughout the State in a fitting manner. Meetings were held in which the necessity and importance of the tree plant- were celebrated throughout the State in a fitting manner. Meetings key to several industries and compliment to Agriculture were well ings and sapplings. The number of trees and seedlings planted Questionnaires were prepared for the collection of data by the dis- were scrutinized and consolidated partly.

| <i>Name of the Agricultural divisions.</i> | <i>Total number of<br/>plants and trees<br/>planted.</i> |
|--------------------------------------------|----------------------------------------------------------|
| (1)                                        | (2)                                                      |
| Guindy .. .. .                             | 81,262                                                   |
| Chingleput .. .. .                         | 117,468                                                  |
| Polur .. .. .                              | 160,455                                                  |
| Vellore .. .. .                            | 274,640                                                  |
| Cuddalore .. .. .                          | 53,528                                                   |
| Villupuram .. .. .                         | 74,419                                                   |
| Salem .. .. .                              | 204,612                                                  |
| Krishnagiri .. .. .                        | 508,692                                                  |
| Thanjavur .. .. .                          | 40,200                                                   |
| Pattukkottai .. .. .                       | 28,050                                                   |
| Mayuram .. .. .                            | 25,528                                                   |
| Kumbakonam .. .. .                         | 22,329                                                   |
| Tiruchirappalli (North) .. .. .            | 114,142                                                  |
| Tiruchirappalli (South) .. .. .            | 163,333                                                  |
| Madurai .. .. .                            | 122,476                                                  |
| Dindigul .. .. .                           | 161,463                                                  |
| Sattur .. .. .                             | 1,235                                                    |
| Sivaganga .. .. .                          | 27,153                                                   |
| Tirunelveli .. .. .                        | 52,468                                                   |
| Sankarankoil .. .. .                       | 27,017                                                   |
| Erode .. .. .                              | 23,579                                                   |
| Coimbatore .. .. .                         | 74,237                                                   |
| Ootacamund .. .. .                         | 675,070                                                  |
| Nagercoil .. .. .                          | 357,882                                                  |
| <b>Grand total ..</b>                      | <b>3,381,238</b>                                         |

## XII. AGRICULTURAL MARKETING.

*Market surveys.*—A special scheme was sanctioned for bringing up to date the market survey reports on important crops. A special Assistant Marketing Officer (Survey) was appointed for the same. Questionnaires were prepared for the collection of data by the district staff to bring up to date the survey reports and brochures on wheat, rice, millets, pulses, gingelly and tapioca. The detailed data collected and received with regard to wheat and wheat products were scrutinized and consolidated partly.

Supplementary information on the following subjects was furnished to the Agricultural Marketing Advisor to the Government of India, Nagpur :—

1. Particulars on the transport of eggs by railway.
2. Remarks on the prevention of adulteration in betelnuts.
3. Remarks on the regulation of fruits and vegetables markets under Agricultural produce Market Act.
4. List of assembling markets in the State
5. Particulars of goat hair.
6. Particulars on Groundnut furnished to the Deputy Senior Marketing Officer, Madras-4.
7. Replies to the questionnaire on the Marketing of citrus fruits in Madras State.
8. Remarks on the adoption of metric weights.
9. Particulars on the transport by rail of lime and vegetables.
10. Particulars on the price spread of some important varieties of betelnuts.

*Grading of Agricultural produce.*—One Assistant Marketing Officer (Agmark Grading) and eight Marketing Assistants were sanctioned during the period for the development of grading of Agricultural produce under Agmark specifications of the Government of India.

Tarkets were fixed districtwise for grading of all the Agricultural Commodities like ghee, gingelly oil, groundnut oil, coconut oil, castor oil, rice, sugarcane, jaggery, potatoes, eggs, sathukudi, oranges, cotton and mangoes under the Agricultural Produce (Grading and Marketing) Act, 1937. Effective propoganda was done by the staff in the districts for achieving the targets fixed by inducing new merchants to become authorised packers under the Act. Enlistment of packets and popularisation of consumption of Agmark products in both the Government and private institutions like hospitals, jails, hostels, co-operatives, etc., were done on a large scale.

The Assistant Marketing Officer (Grading) was engaged in visiting all the districts and giving instructions to the Marketing Assistants to achieve the targets fixed for grading work.

With a view to grade the ghee and edible oils of the small merchants, the State laboratories already started at Karur, Dharapuram and Coimbatore functioned during the year. Separate targets to be achieved by each laboratory were fixed. Because of the demand for further State Laboratories Government sanctioned opening of additional laboratories at Madras and Madurai for ghee and oils, Vellore for jaggery and other miscellaneous articles and Virudhunagar for cotton and other commodities. Steps were taken to start the laboratories at any early date.

The progress of grading in the Madras State for different Agricultural Commodities were as detailed below :—

3-1 : *Ghee*.—There were 21 authorised packers at the beginning of the period. Four authorised packers were enlisted during the period. A quantity of 16,167 maunds valued at Rs. 40,46,000 was graded during the year under report as compared to 13,982 maunds in the previous year. (The information regarding total quantity graded during the year includes the quantities graded by authorised packers through the State Laboratories also). The Agmark ghee has become popular both within the State and outside the State.

3-2 : *Gingelly oil*.—There were nine authorised packers during the period. A total quantity of 4,302 maunds valued at Rupees 3,58,000 was graded during the period under report as compared to 9,282 maunds valued at Rs. 5,83,153 in the previous year. With the advent of the new State laboratories, there is scope for greater activity in this commodity.

3-3 : *Groundnut oil*.—The one packer of groundnut oil graded 3,150 maunds valued at Rs. 253,194 during the year as against 4,441 maunds valued at Rs. 330,862 during the previous year. The quantity graded would be pulled up, with the starting of the State laboratories as there is scope for the same.

3-4 : *Rice*.—During the period under review 25 packers continued to grade rice. More packers were authorised to grade rice during the period. All the packers together graded a quantity of 55,000 maunds valued at Rs. 13,82,000 during the period as compared to 45,363 maunds valued at Rs. 901,481 during the previous year. As a result of the special drive given, a large number of packers would be enlisted for grading and the quantities graded are expected to be greater in the coming years.

3-5 : *Potatoes*.—There were 13 authorised packers during the year. These parties graded 3,862 maunds valued at Rs. 71,320 as against 5,885 maunds valued at Rs. 89,125 during the previous

year. The jails were the main consumers of Agmark potatoes. Arrangements are under way to grade potatoes through the Nilgiris Co-operative Marketing Society at Mettupalayam itself.

3-6 : *Eggs*.—Seventeen authorised packers during the period graded a total number of 2,851,427 eggs valued at Rs. 3,88,700 as compared to 1,644,404 valued at Rs. 1,92,944 during the previous year. Due to canvassing consumers demand the Tuberculosis hospitals have given thought to the purchase of graded eggs and this commodity would be graded in large numbers in the coming years. Arrangements were made to take upgrading of duck eggs also.

3-7 : *Fruits*.—Sathukudi oranges were the only fruits graded this year. A total of 16,181 numbers of fruits valued at Rs. 2,500 were graded as against nil quantity graded last year. The hospitals were the main consumers. Efforts were made to popularise graded sathukudies and kamala oranges in addition to mangoes, by enlisting new packers for these commodities.

3-8 : *Jaggery*.—Grading of cane jaggery could not be started during the year under report. A number of packers were enlisted in the districts for grading jaggery. With the starting of the State laboratory at Vellore for jaggery grading, a great fillip would be given for grading jaggery.

3-9 : *Others*.—Efforts to grade MCU. 1 and MCU. 2 long staple cotton produced in Ramanathapuram district were made. The grade specifications were tentatively fixed by the Agricultural Marketing Advisor, Nagpur and after the starting of a State Laboratory at Virudhunagar for grading cotton, the work would be taken up.

Under the supervision of the special staff of the Directorate of Marketing and Inspection, the compulsory grading of tobacco, bristles, wood and essential oils continued in the State during the year under review.

3-10 : *Agmark packers' Association*.—An Agmark Packers' Association was started with the object of promoting grading of produce under 'Agmark' specifications. Several meetings with responsible Agmark packers and other merchants were held, and a general gathering of the merchants nearly hundred in number was arranged to unanimously pass a resolution for starting an Association of Agmark packers in Madras State. Incidentally it may be noted that this kind of Association is the first of its kind in India and the inaugural function of the association would take place under the auspices of the Central and State Ministers.

*Regulated markets*.—During the year under report the Madras Crop Co-operative Marketing Act, 1933 was enforced in South Arcot district for groundnut, cotton and gingelly, in North Arcot for groundnuts, in Coimbatore for cotton, tobacco and groundnut and

in Tiruchirappalli for groundnut and tobacco. In Ramanathapuram and Tirunelveli revival of the Market Committee was taken up during the year after the Judgment of the supreme Court.

By the close of the year, there were twenty-six regulated markets under the different market committees as enumerated below :—

| Name of the market committee.            | Number of regulated markets. |
|------------------------------------------|------------------------------|
| 1 South Arcot Market Committee .. ..     | 9                            |
| 2 North Arcot Market Committee .. ..     | 8                            |
| 3 Coimbatore Market Committee .. ..      | 5                            |
| 4 Tiruchirappalli Market Committee .. .. | 4                            |

Out of the above 26 regulated markets, three regulated markets, viz., Polur and Wandiwash in North Arcot and Ariyalur in Tiruchirappalli were opened during the year.

The coverage of area under notified crops in the district concerned to the total acreage in the State was as hereunder :—

| Name of crop.    | Area benefited by the Act. | Total area under the crop in acres. | Percentage of area benefited. | District.                                                              |
|------------------|----------------------------|-------------------------------------|-------------------------------|------------------------------------------------------------------------|
| (1)              | (2)                        | (3)                                 | (4)                           | (5)                                                                    |
|                  | ACRES.                     |                                     |                               |                                                                        |
| (a) Cotton ..    | 773,685                    | 1,020,667                           | 75.84                         | Coimbatore, South Arcot, Ramanathapuram, Tirunelveli.                  |
| (b) Groundnut .. | 1,430,070                  | 1,919,692                           | 74.52                         | South Arcot, North Arcot, Coimbatore, Ramanathapuram, Tiruchirappalli. |
| (c) Tobacco ..   | 28,037                     | 47,520                              | 58.98                         | Coimbatore, Tiruchirappalli.                                           |
| (d) Gingelly ..  | 41,121                     | 278,081                             | 14.79                         | South Arcot.                                                           |

12. The progress of work in each market committee during the year under report is furnished below in detail :—

*A. Coimbatore Market Committee, Tirupur.*—The Coimbatore Market Committee continued to function with five regulated market yards at the following places, viz., Tirupur, Pollachi, Gobichettipalayam, Erode and Coimbatore.

During the period under report, the arrivals to the Commission mundies housed in the Tirupur regulated Market were 158,759 pothis of Cambodia kapas and 18,116 pothis of karunganni kapas.

The disposals were 164,529 pothis of Cambodia kapas and 18,825 pothis of Karunganni kapas. Out of this 137 pothis of kapas were sold through the committee directly on behalf of the growers.

The Coimbatore Regulated Market received 1,174 candies of Cambodia lint and 45 candies of Karunganni lint. One thousand four hundred and eighty-four candies of Cambodia and 95 candies of Karunganni lint were sold. There were no arrivals of the notified crops into other regulated markets during the period under report.

| Enforcement.                       | 1959-60 | 1958-59. |
|------------------------------------|---------|----------|
| (1)                                | (2)     | (3)      |
| Licences under section 5 (1) .. .. | 2,798   | 1,981    |
| Licences under section 5 (3) .. .. | 2,689   | 1,661    |
| Registrations .. ..                | 6       | 20       |
| Weighmen .. ..                     | 1,294   | 654      |

The above statement shows the progress of licensing during the period as compared with the progress made during the corresponding period of the previous year. There was marked increase in the licensing of cotton and tobacco and it was due to the special effort taken in checking the accounts of the licensed dealers in cotton and tobacco and finding out unlicensed outside dealers and village dealers and getting them licensed. The textile mills as usual had co-operated with the committee by voluntarily paying the cess due from them. The oil mill-owners and groundnut merchants refrained from paying the cess. There was also a fair progress in the collection of tobacco cess as a result of the persistent efforts made by the staff especially in Palladam taluk.

*Details of complaints filed for violation.*—Number of complaints pending at the end of the period were 50. The complaints which were pending at the beginning of the year under report were filed at the far end of the year 1959, giving sufficient time for traders to remit the licence fees due. Many of the complaints relate to dealers transacting business in shandies and to dealers from other States like Bombay, Mysore, Kerala and Andhra and from places in other districts of the Madras State who made purchases in the notified area.

The two appeals filed by the committee against the decision of the High Court in respect of the two writ petitions relating to the system of sales in the regulated markets and to levy and collection of cess under section 11 (1) of the Act, have not been taken up for hearing. The two second appeals filed by the tobacco merchants of Sundakamuthur against the judgment of the District Judge, Coimbatore, questioning the legality of collection of licence fee and cess by the committee, are also pending in the High Court.



Quantity of notified commercial crops removed and permits issued during the period were as follows:—

| Commodity.      | Permits. | Quantities.                                                      |
|-----------------|----------|------------------------------------------------------------------|
| (1)             | (2)      | (3)                                                              |
| Cotton .. ..    | 472      | 762 pothis of kapas of 280 lb. and 7,295 candies lint (784 lb.). |
| Groundnut .. .. | 5        | 183 bags (177 lb.) of kernel and 751 bags of pods (84 lb.).      |
| Tobacco .. ..   | 1,033    | 1,823 candies of 500 lb.                                         |

**South Arcot Market Committee, Cuddalore.**—The South Arcot Market Committee continued to function with nine regulated markets during the period. Arrivals to regulated markets of the Committee were as furnished below:—

|                         |              |               |
|-------------------------|--------------|---------------|
| Groundnut kernels .. .. | 282,503 lots | 60,686 tons.  |
| Gingelly .. ..          | 8,525 lots   | 9,848 bags.   |
| Cotton kapas .. ..      | 2,082 lots   | 1,355 pothis. |

Cotton arrivals improved during the year under report. The quantum of arrivals was however poor as traders or their agents make direct purchases from the producers. The number of licences enlisted during the period is noted below:—

|                     | Groundnut. | Gingelly. | Cotton. | Total. |
|---------------------|------------|-----------|---------|--------|
| Section 5 (1) .. .. | 2,604      | 227       | 49      | 2,880  |
| Section 5 (3) .. .. | 2,046      | 125       | 54      | 2,225  |
| Weighmen .. ..      | 1,988      | ..        | ..      | 1,988  |

The licences issued during the corresponding period of the last year were 5,867 under 5 (1), 2,183 under 5 (3) and 195 licences under weighmen. The Collector, South Arcot, continued as the ex-officio Chairman of the committee during the period under report. Steps were taken for reconstituting the committee by election held on 11th July 1960.

**North Arcot Market Committee, Vellore.**—Including the two market yards opened, one each at Wandiwash and Polur, there were eight regulated markets under the committee. The arrivals of groundnut kernels into the regulated markets amounted to 27,175 bags of kernels as against 19,760 bags during the corresponding period of the previous year. The committee issued 4,168 licences under 5 (1), 4,012 licences under 5 (3) and 1,246 under weighmen as against 3,302 licences under 5 (1), 3,105 licences under 5 (3) and 895 licences under weighmen during the previous year. During the year a total number of 2,191 permits were issued and 12,943 tons of kernels were despatched outside the North Arcot district. The receipts by way of cess, licence fees, etc., was Rs. 1,19,070-89 as against Rs. 1,13,773-88 during the previous year.

**Tiruchirappalli Market Committee, Tiruchirappalli.**—During the year under report, the fourth regulated market of the committee was established at Ariyalur. Of the three regulated markets established last year, Jayakondam Regulated Market alone was working satisfactorily. The Committee issued 2,374 licences under 5 (1), 2,163 licences under 5 (3) and 1,812 licences under weighmen during the fasli year 1959-60 as against 793 licences under 5 (1), 619 licences under 5 (3) and 351 licences under weighmen during the corresponding period of the last year. The receipt by way of cess, licence fees, etc., was Rs. 79,127.

**Ramanathapuram Market Committee, Virudhunagar.**—In the absence of an elected committee, the functions of the committee were continued to be performed by the Sub-Collector, Sivakasi, as ex-officio Chairman of the committee. Particulars of applications submitted for issue of licences were as follows:—

One hundred and ninety-one applications for licences under 5 (1), 172 applications for licences under 5 (3) and 123 applications for licences under weighmen. So far a sum of Rs. 5,630 had been collected by way of licence fees. The Government granted a loan of Rs. 2,000 towards expenditure of the committee.

**Tirunelveli Market Committee, Koilpatti.**—As the Committee was not reconstituted, it functioned under the ex-officio Chairman during the year under report. The Secretary was appointed to this Market Committee as per G.O. Ms. No. 265, dated 30th January 1960 and he assumed charge on 2nd March 1960 afternoon. The following numbers of licences were enlisted till the end of the fasli year 1959-60, section 5 (1) 25, section 5(3) 28 and weighmen 22. During the year the Committee was granted a loan of Rs. 2,000. The revenue collections by way of licence fees of the committee came up to Rs. 1,446 up to the end of the period.

#### Market legislation on Madras Commercial Crop Markets Acts and Rules.

**Acts.**—There was no amendment to the Madras Commercial Crops Markets Act, 1933, during the period under report.

**Rules.**—The following amendments and draft amendments to the Commercial Crops Markets Rules, 1948 and other rules were made during the period under report.

#### Amendments.

| Rule.                               | G.O. number and date.                                              |
|-------------------------------------|--------------------------------------------------------------------|
| M.C.C.M. Rules—Rule 78 ..           | G.O. Ms. No. 3849, Food and Agriculture, dated 10th November 1959. |
| Secretaries Service Rules—Rule III. | G.O. Ms. No. 1479, Food and Agriculture, dated 23rd October 1959.  |
| M.C.C.M. Financial Rules—Rule 59.   | G.O. Ms. No. 1479, Food and Agriculture, dated 21st April 1960.    |

*Draft amendments.*

|                        |          |         |                                                               |
|------------------------|----------|---------|---------------------------------------------------------------|
| M.C.C.M. Rules         | Officers | Service | G.O. Ms. No. 2451, Food and Agriculture, dated 3rd July 1959. |
| M.C.C.M. Rules—Rule 78 | (a) (i). |         | G.O. Ms. No. 766, Food and Agriculture, dated 4th March 1960. |

*Market Intelligence.*—Enquiries on market information from growers co-operative societies and members of the trade were attended to as usual. A directory of merchants, growers, etc., was maintained up to date and information was furnished to all when required. Weekly, fortnightly and monthly reports of prices for important agricultural commodities from the important assembling markets were obtained and maintained. The following weekly fortnightly and monthly reports were prepared and sent by the Marketing Section to the different departments as detailed below. Market Committees published daily and weekly prices of notified crops giving stock position also in important dailies.

*Reports.**To whom due.*

|                                                                                                                                                                                                                              |                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| (a) Weekly arrivals, disposals and prices of milch cattle at Tiruvottiyur.                                                                                                                                                   | Director of Statistics, Madras.                                                                     |
| (b) Monthly review of Market Conditions.                                                                                                                                                                                     | Government through Director, Agriculture, Madras.                                                   |
| (c) Monthly report of Marketing Section on the development activities.                                                                                                                                                       | Director of Agriculture, Madras, Agricultural Marketing Adviser to the Government of India, Nagpur. |
| (d) Monthly prices of fruits and vegetables, livestock and its products.                                                                                                                                                     | Director of Statistics, Madras, Marketing Development Officer, Madras.                              |
| (e) Monthly report on Cotton situation and textile situation in Madras State.                                                                                                                                                | Director of Agriculture, Madras.                                                                    |
| (f) Reports on the details of activities of Market Committees and market conditions of commercial crops as reported by the Market Committee for publishing as a Supplement styled as the <i>Market Committee Chronicle</i> . | Editor, <i>Madras Agricultural Journal</i> , Coimbatore.                                            |
| (g) Fortnightly prices of turmeric in the markets of Erode and Salem.                                                                                                                                                        | Secretary, Spices Exchange, Sangli.                                                                 |

Besides the above, the Director of Statistics was supplied with weekly prices of hides and skins, straw and sugar direct by the Assistant Marketing Officers.

The Market Committees continued to issue daily and weekly bulletins of arrivals, disposals and prices for the benefit of the growers. These information were also published in the leading dailies every week. The Director of Statistics, Madras, was also supplied with arrivals, disposals, prices, consumption, imports and exports of certain important agricultural commodities by the Assistant Marketing Officers and Market Committees.

*Co-operative marketing.*—The staff of this section both at headquarters and mufussal continued to contact important co-operative marketing societies and rendered all possible help in

better marketing of and processing of Agricultural Commodities. The following societies were helped in the marketing of their produce :—

- 1 Katpadi Engineering Co-operative Marketing Society.
- 2 The Nilgiris Co-operative Marketing Society.
- 3 T.U.C.S., Madras.
- 4 T.U.C.S., Tiruchirappalli.
- 5 Allapuram and Thorapadi Co-operative Society, Vellore.
- 6 The South Arcot District Co-operative Marketing and Supply Society, Cuddalore.
- 7 The Chingleput District Wholesale Co-operative Stores, Madras.
- 8 All the Oil producers co-operative sales societies in the State who were given subsidy from the small-scale industries department for construction of tanks for storage of oil for grading purpose.

During the period under report, six new Co-operative Marketing Societies were registered. The Co-operative Markets in the State received Rs. 239.86 lakhs worth of produce from members and Rs. 176.94 lakhs worth of produce were sold. Agricultural implements, seeds, etc., were sold to the tune of Rs. 187.12 lakhs. The Marketing Societies advanced Rs. 137.93 lakhs to the ryots on the pledge of the produce.

*Warehousing.*—The Madras State Warehousing Corporation, steadily expanded its business during the year under report. At the beginning of the year, four temporary warehouses at Salem, Vellore, Madurai and Virudhachalam were functioning. Seven more temporary warehouses at Nagapattinam, Kavur, Dindigul, Tuticorin, Pollachi, Erode and Kancheepuram were opened during the year bringing the total capacity to 5,800 tons.

There was a stock of 91,925 standard maunds in deposit at the end of the year. During the year as many as twenty-nine commodities were deposited at the warehouse. Proposals were submitted to the Government to include such commodities, viz., Groundnut Oil cakes, Neem seeds, Tapioca flour, Cashewnut, cotton seeds, etc., to the schedule. Government permitted the Corporation to levy storage charges at a rate not exceeding six naye Paise per manud per month for any commodity packed in bags irrespective of the area. The storage charges were accordingly revised with effect from July 1960.

Local Advisory Committees were constituted at six centres, consisting of Officials and representatives of Co-operative Societies, Agriculture and trade. The Committees were meeting at regular intervals and discussed matters of local importance, probable effect of increase in the storage charges, availability of suitable godown accommodation on hire and on specific subjects referred to them for opinion.

As a result of working of the eleven temporary warehouses in hired accommodation, the Corporation succeeded during the year in introducing the warehouses receipts as an instrument for raising loans on easy terms from commercial banks. The State Bank of India and other banks and other scheduled banks advanced a sum of Rs. 20,76,377 against receipts issued by the Corporation's warehouses. More and more people understood the advantages of depositing their produce in the warehouses.

*Market Legislation.*—The Agricultural Produce Markets Bill which was drafted in accordance with views of the Expert Committee appointed in 1957 was placed before the Joint Select Committee of both the houses for scrutiny and was passed. The various rules for the new Act are being drafted and are under scrutiny. When the new Act is enforced it will be more comprehensive and will comprise of more Agricultural Commodities. The present Act will stand repealed when the new Act is enforced.

Remarks on the amendments to various Acts and rules were offered during the period besides Madras Commercial Crop Market Act and the rules thereunder.

*National Five-Year Plan.*—Government have allotted Rs. 25 lakhs for the Agricultural Marketing Schemes for the Third Five-Year Plan. Detailed proposals on the following schemes for 1961-62 indicating the cost, staff, etc., were submitted.

*Schemes.*—(1) Scheme for provision of loans to market Committees for improvement of Market yard and other amenities therein (provision for establishment of regulated market yards under Package Deal scheme in Tanjore district).

(2) Scheme for provision of grading services to regulated Market Yards, Warehouses, etc., by employing trained graders, providing grading equipments and setting up of adequate supervisory grading centres for promoting quality control and settling disputes over quality control.

(3) Scheme for entertainment of Supervisory staff in the Regulated Markets in Madras State for improvement of Market Regulations.

(4) Scheme for establishment of five State Ghee and Oil Grading Laboratories, including attaches, refineries for promotion of Agmark Standards in Madras State.

(5) Scheme for strengthening of Marketing Department, Madras State including Marketing Extension Wing and providing advanced training in Agricultural Marketing.

A scheme proposed by the State Marketing Officer for collection of data on cost of cultivation and fixing minimum price for agricultural Commodities in the Madras State, was accepted. But due to the paucity of technical personnel, the proposal was deferred for one year.

*Transport.*—Railway data on imports and exports were collected as usual and compiled for important railway stations at the assembling, distributing and terminal market centres. Data on imports and exports by sea were collected for all Agricultural Commodities and livestock products.

Separate reports on the Transport of lime and vegetables and eggs over railway were sent to Agricultural Marketing Adviser, Nagpur.

*Propaganda and publicity.*—With a view to give fillip to the propaganda and publicity work on Agricultural Marketing a scheme was sanctioned by the Government and a special Assistant Marketing Officer (Propaganda and Publicity) was appointed. Organized effort was made during the year to educate the mass regarding the advantages of selling their produces through Regulated Markets and grading of the Agricultural Commodities under Agmark Specifications.

This section participated in the two major exhibitions, viz. The All-India Khadi and Swadeshi Industrial Exhibition, Teynampet and Chittarai Festival Exhibition at Madurai. Besides the two major exhibitions, three minor exhibitions were arranged one at Aduthurai during the inauguration of the Package deal scheme, in Tanjore district, the other at Ariyalur during the opening of the regulated markets at Ariyalur and the third at Neerathanallur Cattle Show.

Ten attractive painted metal posters on Agmark Models on Regulated Market and Ghee Grading Laboratory, charts showing Grading Centres and Regulated markets were made for the Museum at the Office of the State Market Officer.

One Radio taluk was sent to All-India Radio on Agmark. A leaflet detailing out the benefits of regulated markets was sent for printing for distribution in the areas newly to be notified. Proposals for two film shoots on Agmark and Regulated Markets are under consideration and the scripts were also under preparation. Proposals for two cinema slides and two gramophone records were examined and are being finalized with necessary catchy themes.

*Education in Marketing.*—Sri Thejamoorthy, Marketing Assistant, Pondicherry who was deputed for the training in Marketing at the Directorate of Marketing and Inspection, Nagpur returned from Nagpur. Sri Arumugavelu, Horticultural Assistant, Tanjore, was selected and deputed to the training for the year 1960-61 to be commenced from 1st August 1960.

During the period the State Marketing Officer gave lectures at Madras to the Co-operative Trainees of other states on Agricultural Marketing and Regulated Markets. He also gave lectures to the persons who are under Post-graduate training in the Directorate

of Marketing and Inspectors, Nagpur. The State marketing officer also visited Tirupati and gave lectures to the trainees of Co-operative and Block Level Training Centre, Tirupati.

*Work done on behalf of other departments and for private enquiries.*—Information on various subjects relating to the production, supply, movement, prices and other economic aspects was supplied to different heads of departments in the States and other States. The details of information furnished to the Director of Agriculture are treated as a part of regular duties. The production and marketing data on the marketable surplus of onions, chillies, groundnut, groundnut oil, Bran, Dhall, husk, etc., were marked out in detail and furnished to Government through Board of Revenue for working out annual export allocations.

Following additional information were furnished to the Board of Revenue, Madras :—

(1) Data on the quantity of sugar required in the State and the quantity produced in this State for 1958-59 for answering legislative Assembly question.

(2) Remarks on the import of pulses and grains from Burma and other places into Madras State.

(3) Information on the trend in prices of foodgrains from January 1959.

(4) Remarks on the demand and supply of eggs.

(5) Remarks on the rise in prices of tamarind and steps taken by Government to reduce it for answering a legislative Assembly question.

(6) Remarks on the rising trend in price of groundnut oil for answering a Legislative Assembly question.

(7) Information on the quantity of oilcake exported from Madras State.

(8) Particulars regarding consumption of fuel (wood) in the State, for answering a Assembly question.

*Scheme for the dissemination of market news service for Cardamom.*—The important assembling centres in Madura district such as Bodinaickanoor, Thevaram, Pannaipuram, Kombai, Uthamapalayam, Cumbum, Cuddalore, Pattiveeranpatti and Virudhunagar in Ramanathapuram district were periodically visited by the Special Marketing Assistant, Cardamom and weekly report on the condition of crop, rainfall, Agricultural operation, stocks, arrivals, disposals, closing stock prices of cardamom in the important assembling centres of the above two districts were sent to the Director of Information and the Director of Statistics every week. The prices and stock position in the important markets in North India were also incorporated in the weekly reports.

Despatches of cardamom from Bodinaickanoor were mainly to Bombay, Calcutta, New Delhi, Amirthsar, Kanpur, etc., besides large quantities were also exported to United Kingdom and Continental ports. With the gradual increase in arrivals of Cardmom, the prices also began to decline.

#### Prices of Cardamom—

| Bodinaickanoor—       |    |    |    | RS. | NP. |         | RS. | NP. |
|-----------------------|----|----|----|-----|-----|---------|-----|-----|
| Special .. .. .       | 9  | 84 | to | 11  | 00  | per lb. |     |     |
| Superior bulk .. .. . | 9  | 07 | to | 10  | 89  | "       |     |     |
| Medium Bulk .. .. .   | 8  | 38 | to | 10  | 63  | "       |     |     |
| Inferior Bulk .. .. . | 8  | 06 | to | 9   | 85  | "       |     |     |
| Pattiveeranpatti—     |    |    |    |     |     |         |     |     |
| Sundried.. .. .       | 8  | 02 | to | 11  | 27  | "       |     |     |
| Store-green .. .. .   | 8  | 40 | to | 11  | 32  | "       |     |     |
| Seed and Rice .. .. . | 8  | 02 | to | 12  | 42  | "       |     |     |
| Virudunagar—          |    |    |    |     |     |         |     |     |
| Bold Quality .. .. .  | 9  | 75 | to | 11  | 50  | "       |     |     |
| Superior.. .. .       | 10 | 00 | to | 11  | 00  | "       |     |     |
| Small .. .. .         | 8  | 50 | to | 10  | 00  | "       |     |     |

*Review of market conditions.*—Arrivals of paddy and rice in the different markets were mainly from Andhra, besides local crop. Export of rice to Kerala State continued throughout the period. Prices showed an upward trend from July to the end of December; but gradually decreased during January due to increased arrivals of paddy from Thanjavur, Tiruchirappalli and other districts.

Prices of millets, viz., cholam, ragi, cumbu were firm in the different markets during the period. Besides the local crop, there were imports from the neighbouring States of Andhra, Bombay and Mysore.

There was a general increase in prices in the case of pulses also especially redgram, blackgram and bengalgram and the prices continued to be firm throughout the period. There were heavy arrivals of pulses from North India throughout the year.

The arrivals of tamarind in most of the consuming markets in the State included both local production in the State, viz., Salem district and arrivals from Bangalore or Mysore State. Export of chillies, onions and cane jaggery to Ceylon, Malaya, Kerala State and North Indian States continued throughout the year. Prices of chillies declined at the end of January 1960 due to good arrivals of new crops. The prices of cane jaggery increased during the month of September and October 1959 due to good demand and declined during the month of May and June 1960. Prices of Cambodia kapas and lint were Rs. 140 per pothi of 280 lb. and Rs. 980 per candy of 781 lb. respectively in Tiruppur market on the 1st July 1959 and it was Rs. 155 for kapas and Rs. 980 for lint during the end of the Fasli Year.

## XIII. AGRICULTURAL ENGINEERING.

The activities of the Agricultural Engineering Branch are confined, to the application of engineering aids to Agriculture in the field of soil conservation, implements and machinery, power farming or minor irrigation. This, the important activities are soil conservation, research and popularisation of improved agricultural implements, hiring and hire purchase of essential machinery such as the engines, pumpsets, tractors, sinking of filter point tube wells, artesian and sub-artesian wells and organization of River Pumping Schemes.

The Agricultural Engineering Branch is now under the control of Joint Director of Agriculture (Engineering). He is assisted at headquarters by one Deputy Director (Drilling), one Agricultural Engineer (Soil Conservation) and one Assistant Agricultural Engineer (Headquarters). The post of one Additional Assistant Agricultural Engineer (Headquarters) has been retrenched and converted as Assistant Agricultural Engineer (Inspection) at Vellore. Besides the above, there are (1) a General Superintendent at Madras in charge of Government Industrial Engineering Workshop, (2) an Assistant Agricultural Engineer at Saidapet in charge of Central Agricultural Engineering Stores, for stocking of oil engines and pumpsets, etc., that are required for distribution to ryots under hire-purchase scheme, (3) an Assistant Agricultural Engineer at Coimbatore, in charge of Agricultural Engineering Research Workshop to conduct research on improved implements, (4) an Assistant Agricultural Engineer at Coimbatore in charge of Tractor Workshop which is intended for attending to repairs and manufacture of spares for tractors. The post of the Assistant Director (Drilling), Coimbatore was transferred to Salem with effect from April 1960, as per reorganisation, to carry out the District Work on Agricultural Engineering Side in that district. For carrying out the Soil Conservation schemes in various places in the State, Assistant Agricultural Engineers are working in the following places :—

|                    |                           |
|--------------------|---------------------------|
| Ootacamund .. .. . | Nilgiris district.        |
| Coonoor .. .. .    |                           |
| Dindigul .. .. .   | Madurai district.         |
| Manaparai .. .. .  | Tiruchirappalli district. |
| Coimbatore .. .. . |                           |
| Palladam .. .. .   | Coimbatore district.      |
| Panrutti .. .. .   |                           |
| Vellore .. .. .    | South Arcot district.     |
| Salem .. .. .      | North Arcot district,     |
|                    | Salem.                    |

With a view to give relief to the District Agricultural Officers and on the recommendation of the Committee on Estimates, the engineering work of the department in the districts was reorganized and the State is at present divided into eight zones and each zone is placed under the charge of an Assistant Agricultural Engineer to

look after the Agricultural Engineering activities. The jurisdiction and headquarters of the Assistant Agricultural Engineers are indicated below :—

| Name of Assistant Agricultural Engineer.                                        | Headquarters, | Jurisdiction.                          |
|---------------------------------------------------------------------------------|---------------|----------------------------------------|
| (1)                                                                             | (2)           | (3)                                    |
| Assistant Agricultural Engineer, Saidapet (Inspection), Saidapet.               | .. ..         | Madras and Chingleput districts.       |
| Assistant Agricultural Engineer, Vellore (Inspection), Vellore.                 | .. ..         | North Arcot district.                  |
| Assistant Agricultural Engineer, Cuddalore (Inspection), Cuddalore.             | .. ..         | South Arcot.                           |
| Assistant Director (Drilling), Salem.                                           | .. ..         | Salem district.                        |
| Assistant Agricultural Engineer, Tiruchirappalli (Inspection), Tiruchirappalli. | .. ..         | Tiruchirappalli district.              |
| Assistant Agricultural Engineer, Madurai (Inspection), Madurai.                 | .. ..         | Madurai and Ramanathapuram districts.  |
| Assistant Agricultural Engineer, Tirunelveli.                                   | .. ..         | Tirunelveli and Kanyakumari districts. |
| Assistant Agricultural Engineer, Coimbatore (Inspection), Coimbatore.           | .. ..         | Coimbatore and Nilgiris districts.     |

The Engineering activities in Thanjavur district still continue to be under District Agricultural Officer, Thanjavur.

Besides, one Assistant Director (Drilling) is in charge of a pilot scheme for sinking artesian and sub-artesian wells in Chidambaram taluk at Chidambaram.

The main functions of the Agricultural Department on the Engineering side are (1) To demonstrate to the ryots the use of machinery and improved mechanised methods of cultivation and thereby increase agricultural production and save labour costs. For this purpose the department has several kinds of agricultural machinery like tractors, bulldozers, allied implements; puddlers, oil engines and pumpsets, hand boring sets, power drills and attached implements. These are hired out to the ryots at reasonable rates.

(2) The department supplies tractors, oil engines and electric motors also under hire-purchase system to enable even the ordinary ryots who could not afford to pay ready cash to possess their own machinery.

(3) In addition to the above, iron materials required for agriculture are also supplied to the ryots by the department and research is carried out on different types of implements required by the ryots to suit local practices and soil conditions.

(4) The department has also launched a number of soil conservation and contour bunding measures by which lands, which have been subject to severe erosion are reclaimed, levelled and bunded. Other mechanical ways are allowed to bring under cultivation year after year, cultivate waste and fallow areas in the various districts.

(5) Sinking of filter point tube-wells and supply of boring sets and power drills for agricultural operations to agriculturists.

(6) All other allied subjects pertaining to engineering connected with the department.

*Tractor hiring scheme.*—This is a scheme for arranging supply of tractors with matched implements and bulldozers on hire to ryots in the various districts of the State for mechanised cultivation as also to the other departments when required.

The tractor hiring scheme which was started in 1946 as a 'Grow More Food' incentive was continued during the year under report and the same is included in the Second Five-Year Plan. The scheme envisages the reclamation of virgin lands and current fallows in order to bring more area under cultivation and this aids the stepping up additional food production. Land reclamation schemes undertaken by State Government with their own tractors are eligible for Central subsidy of 12½ per cent of gross expenditure or 50 per cent of the net loss, whichever is less. A subsidy of Rs. 1.70 lakhs has been claimed from the Government of India during 1959-60.

The departmental units are also hired for non-agricultural purposes at double the normal rates fixed for agricultural purposes on the specific orders of Government. Normal hire charges are collected for hiring of the units for non-agricultural purposes for Government departments, Local Bodies and for Educational Institution, without prejudice to agricultural operations.

The department is in possession of 78 bulldozers and 60 tractors. The Special Officer, who investigated the working of the Engineering Branch, has recommended for the disposal of all wheel type units in the departmental fleet, as they are found uneconomical to be maintained. Action is being taken to dispose them off. Besides, a Special Officer has been appointed by Government under the control of Chief Engineer (Irrigation), Madras, to inspect all the departmental units and to find out their suitability for their retention as most of these are age-old ones and having served more than their usual period of service and as they deserve to be replaced by new ones. The report of the Special Officer is awaited.

The following are the targets and achievements :—

|                                        | Virgin<br>land. | Current<br>fallows. |
|----------------------------------------|-----------------|---------------------|
| 1 Target for 1959-60 .. .. .           | 13,500 acres.   | 19,000 acres.       |
| 2 Achievements .. .. .                 | 5,435 ..        | 9,286 ..            |
| 3 Additional production in foodgrains. | 1,358 tons.     | 929 tons.           |

The short fall in achievements is mainly due to the fact that most of these are old and they go out of order frequently however carefully maintained. Much difficulty is experienced for procurement of spares ex-stock with firms due to import and foreign

exchange restrictions and hence some units are forced to be idle for want of repairs and replacements for some time. With the condemnation of old units and with the purchase of additional units for which action is being taken, the scheme is bound to work showing better progress in coming years. Action is being taken to commission all sick units by importing spares with the foreign exchange now made available to the tune of Rs. 1,90,000. Action is also being taken to acquire additional units of bulldozers newly with the foreign exchange made available to the tune of Rs. 25 lakhs. There is very heavy demand for bulldozers continuously throughout the year, unlike the seasonal demand for tractors and after the purchase of new units and spare parts, the progress of the scheme is bound to increase considerably.

The distribution of tractors and bulldozers on 30th June 1960 and their auxiliary units and implements are detailed in Appendices Nos. 12 and 18.

The hire charges in force are detailed in Appendix 16 and there were no changes in the rates during the period under report.

*Use of tractors under Soil Conservation Scheme.*—The use of D.4. Tractors, which are of medium type in the Nilgiris district for bench terracing was not only found to be economical but also entitled speedy execution of work. At present about 12 units are working in various centres of Soil Conservation Schemes in Nilgiris and other districts. Action is being taken to increase the strength of bulldozers in the departmental fleet by purchasing suitable units for soil conservation works.

#### AGRICULTURAL MACHINERY ADVISORY COMMITTEE.

The Agricultural Machinery Advisory Committee met thrice during the year under report and the details of the dates and the subjects discussed are furnished below :—

31st July 1959—Selection of firms for the supply of oil engines and electric motors under Hire-Purchase System.

24th December 1959—Inclusion of Russian make tractors in the approved list for purchase and distribution in Tractor Hiring and Hire-Purchase Scheme.

17th June 1960—(i) Consideration of tenders received for 5" casing pipes under Pumping and Boring Scheme.

(ii) Consideration of quotation of Messrs. J. N. Marshal & Co., for the purchase of Zetor (Czechoslovakian make) tractors.

(iii) Recognition of the firm Messrs. Prabhat Trading Syndicate, Madras, for supply of Russian tractors.

*Inspectorate staff.*—Under the reorganization scheme in Agricultural Engineering, the posts of four regional Assistant Agricultural Engineers, the Additional Assistant Agricultural Engineer (Headquarters) and the Assistant Director (Drilling), Coimbatore, have been converted and they were made responsible for the district work formerly done by the District Agricultural Officers.

**Tractor Workshop, Coimbatore.**—The workshop is continuing its useful service in its tenth year, having been started in 1950 as per G.O. Ms. No. 2401, Development, dated 5th August 1949. Servicing, repairing and overhauling the departmental tractors, oil engines, lorries, jeeps, etc., are the objects of the workshop. The workshop has been continued temporarily and sanction for its continuance is obtained every year.

One Agricultural Engineering Supervisor, one Tractor Foreman, one Assistant Tractor Foreman and one peon are the permanent staff of the workshop and the other gazetted and non-gazetted staff—both executive and ministerial—are temporary staff, their latest continuance being permitted in G.O. Ms. No. 1207, Revenue (Food and Agriculture), dated 26th March 1960.

Sanction has been accorded in G.O. Ms. No. 1929, Food and Agriculture, dated 8th May 1959, for opening of a salvage centre in the Tractor Workshop, Coimbatore, with a staff of one Store-keeper, two packers, one carpenter and one blacksmith. However the centre was not started, since the full complement of staff could not be appointed during the year as *ad hoc* rules had to be framed and got approved by Government.

A smithy-carpentry shed was sanctioned to be constructed in G.O. Ms. No. 3124, Food and Agriculture, dated 29th August 1959, and the construction work is in progress.

The construction of a closed shed for accommodating the stores of the Assistant Director (Drilling), Coimbatore, was undertaken at a cost of Rs. 5,000 at the Tractor Workshop and completed during the year under report. All the heavy items of stores belonging to the Assistant Director (Drilling), Coimbatore, transferred to Tractor Workshop and kept in the open space are now stocked in the closed shed newly erected. For providing a Fuel Pump Test Bench for the workshop, Government of India has been addressed for the release of foreign exchange to the extent of Rs. 20,000.

A list of spares manufactured and reconditioned and servicing work done at the Tractor Workshop, Coimbatore, for the period under report are furnished in the Appendices Nos. 20, 21 and 22.

**Tractor Servicing-cum-Repairing Centre, Tiruvapur.**—The centre is continuing to function under the control of Assistant Agricultural Engineer (Inspection), Tiruchirappalli, assisted by the staff sanctioned for the purpose. At present only repairing and servicing of departmental units are attended to.

**Regional Stores.**—The two regional stores at Saidapet and Tiruchirappalli are continuing to function under the control of the Assistant Agricultural Engineers, Saidapet and Tiruchirappalli.

**Loans.**—No loans were disbursed under 'Land Reclamation' and 'Sugarcane Cultivation' schemes during the year.

**Purchase of machinery.**—No additional tractors were purchased during the year under report.

**Reorganization of Engineering Branch of work.**—Government in G.O. Ms. No. 2222, Food and Agriculture, 8th June 1959 have ordered reorganization of engineering activities under the control of Assistant Agricultural Engineers and relieving the District Agricultural Officers of the same and the orders have been implemented from July 1959.

**Tractor Hire Purchase Scheme.**—During the year under report, not much progress could be made due to want of popular makes of tractors in the market. Government of India have been addressed for the release of foreign exchange to the tune of Rs. 10 lakhs for implementing the scheme. During the latter part of the year, one firm, viz., Messrs. J. N. Marshall and Company, Bombay, came forward to supply under the scheme tractors made in Czechoslovakia and imported under rupee payment basis. Five tractors were purchased at a cost of Rs. 80,686 and distributed to the parties under the scheme, during April-May-June 1960.

**Scheme for hiring oil engines.**—The above scheme continued with the existing units during the period under report.

Out of the existing units, one unit was sold on outright cash basis to a ryot who took the units on hire and subsequently requested for sale after allowing the necessary depreciation earmarked for these old sets and a few have been transferred permanently to the Research Stations and State Seed Farms. Out of a target for hiring 290 units to irrigate a minimum of 2,320 acres during 1959-60, the achievement was 290 units were hired which irrigated 10,525 acres.

**Scheme for the purchase and distribution of oil engines and electric motors under Hire-Purchase Scheme.**—This scheme is in operation from 1949, mainly to help the middle class agriculturists who are unable to purchase the pumpsets by paying the entire cost at a time. The machinery is supplied to ryots on annual repayment system, ranging from three to seven years with interest at  $4\frac{1}{2}$  per cent per annum and centage charge at 3 per cent per annum is also collected to cover the establishment charge. (The rates of interest and centage are now increased to 5 per cent and  $3\frac{1}{2}$  per cent respectively from 1st April 1960.) The scheme is financed by the Government of India by way of loan, which is repaid by the State Government in instalments ranging from 10 to 15 years.

Government have sanctioned the scheme during 1959-60 for the supply of 175 oil engines and 475 electric motors at an estimated cost of Rs. 10 lakhs. During the period under report 120 oil engines and 426 electric motors were purchased and distributed at a cost of Rs. 9,54,975.09 nP.



The responsibility for the recovery of instalment amount rests with the department. During the period from the 1st July 1959 to 30th June 1960, a sum of Rs. 3,85,177.25 nP. has been collected from the hire-purchasers towards the instalment dues for the supply of machinery in the previous years. The proposal for transferring the collection work to the Board of Revenue was not agreed to by the Board.

**River Pumping Scheme.**—The two schemes started in 1958 at C. Mutlur village of South Arcot district and Vadamalapuram village of Ramanathapuram district were continued during the period under report. An area of about 40 acres each at C. Mutlur and Vadamalapuram was irrigated. Some more ryots adjacent to the well at Vadamalapuram wanted to avail of the scheme. The sinking of an additional well at a cost of Rs. 7,000 has been got sanctioned by Government. This will bring in another 15 acres under the scheme. The transfer of these two schemes to the co-operatives is under correspondence with the Registrar of Co-operative Societies.

The scheme at Nemmini village of Sattur taluk could not be implemented due to delay in extension of electricity to this village.

The scheme at Alishikudi village could not be implemented due to the unwillingness of the villagers to run the scheme now.

In G.O. Ms. No. 1539, Food and Agriculture, dated 26th April 1960, a scheme has been sanctioned for Ondiampalam village in Thanjavur district and action is being taken to implement the scheme.

In G.O. Ms. No. 2138, Food and Agriculture, dated 28th May 1960, a scheme has been sanctioned for Kalingapatti village in Tirunelveli district, and the estimates are awaited from the Executive Engineer.

**Filter-Point Tube Wells Scheme.**—Filter point well is a device for tapping the underground water for irrigation purposes. Each well can irrigate about 10 acres of land. The scheme was first started in Thanjavur district during 1951-52 and subsequently extended to the entire state except Nilgiris district. Under the scheme, a loan not exceeding Rs. 2,500 is granted to each ryot for sinking the well and purchasing the required machinery. The loan amount will be recovered in five annual equated instalments.

From the inception of the scheme up to 30th June 1960, 4,922 wells have been sunk and a sum of Rs. 94.14 lakhs has been advanced as loan. During the year under report alone 687 wells have been sunk and a total amount of Rs. 9.69 lakhs was spent.

**Pumping and Boring Schemes.**—The department is in possession of 32 power drills and 120 hand-boring sets for hiring to ryots

for sinking tube wells. The hire charges collected for these sets are as follows:—

| Details.                            | Rate per day.         |                                                        |
|-------------------------------------|-----------------------|--------------------------------------------------------|
|                                     | Agricultural purpose. | Non-agricultural purpose.                              |
| (1)                                 | (2)                   | (3)                                                    |
| <b>Machinery H.B. Set.—</b>         |                       |                                                        |
| 0' — 150' from ground Level .. .. . | 2.50                  | } Rupees 10 per day irrespective of the depth of bore. |
| 150' — 250' .. .. .                 | 4.00                  |                                                        |
| 250' — 500' and above .. .. .       | 6.00                  |                                                        |
| <b>Power Drill.—</b>                |                       |                                                        |
| 0' — 350' from ground Level .. .. . | 8.00                  | } Rupees 30 per day irrespective of the depth of bore. |
| 300' — 500' .. .. .                 | 10.00                 |                                                        |
| Above 500' .. .. .                  | 15.00                 |                                                        |

With all the units, the footage bored during the period under report is 1,23,408'-3".

**Artesian Tube-Well Schemes.**—Under the Minor Irrigation Programme sinking of 50 artesian wells during 1959-60 was taken up. On completion of each well it is handed over to the Revenue Department for maintenance.

Water-rate at a flat rate of Rs. 22-50 per acre is being charged from the beneficiaries. In Sethiathope and Srimushnam firkas of Chidambaram taluk in South Arcot district 36 wells have been sunk at a total cost of Rs. 3,96,160 during the period under report.

**Work done in the Government Industrial Engineering Workshop, Washermanpet, Madras.**—During the period under report the turnover came to Rs. 2,14,951. More work orders were entrusted to this workshop, on behalf of the pumping and boring section of the department.

During the financial year ended 31st March 1960 the workshop has earned a net profit of Rs. 27,881.62 nP.

**Advisory Committee on Agricultural Implements.**—The Advisory Committee on Agricultural Implements first constituted in G.O. Ms. No. 3620, Food and Agriculture, dated 21st December 1954 has been permitted to continue for two more years from 15th February 1959 in G.O. R. No. 324, Food and Agriculture, dated 5th March 1959. Among the non-official members, Sri R. Varadharajan of the Farm Equipment Company having resigned his membership, Sri K. Ramaswamy, Partner of Messrs. Elseetee Industries, Coimbatore, has been appointed in G.O. Ms. No. 882, Food and Agriculture, dated 10th March 1960. His term is up to 14th February 1961.

**Iron and steel.**—There was no change in the procedure pertaining to the distribution of iron and steel under the Agricultural quota from the stocks available with the Departmental Stockists.



Government in their Order Ms. No. 3347, Food and Agriculture, dated 23rd September 1959, issued instructions for the submission of applications for enlistment of agricultural fabricators once in every six months in order to make a wholesome selection from all the places in the State and also to give opportunity to all those applied for, instead of the procedure hitherto followed considering the applications individually. This revised procedure is being followed with effect from the half-year ended 31st December 1959. The following quantities of iron and steel were distributed to the agriculturists and the agricultural fabricators from out of the agricultural quota during the period under report :—

|              |    |    |    | T.    | CWT. | Q. | LBS. |
|--------------|----|----|----|-------|------|----|------|
| Standard     | .. | .. | .. | 1,083 | 10   | 0  | 7    |
| Non-Standard | .. | .. | .. | 1,535 | 13   | 2  | 16   |

*Distribution of imported electric motors.*—During the period under report, 136 electric motors were distributed to the bona fide agriculturists.

*Scheme for devising machinery for cultivation and harvesting of groundnuts.*—The scheme has been closed on 21st June 1960.

*Trials of agricultural implements newly evolved at the workshop of the Assistant Agricultural Engineer (Research), Coimbatore.*—(1) *Paddy sheller.*—This was designed at the workshop of the Assistant Agricultural Engineer (Research), Coimbatore, with the help of the late Prof. M. S. Sharp, Technical Co-operation Mission Expert. In this machine the shelled paddy was not thrown out properly due to even flat face of both the discs. Some times the rice gets polished and even crushed. As this required improvement, the Assistant Agricultural Engineer (Research) is seized with the problem now and a final report is awaited.

During the period under report, the following implements and machineries were designed and fabricated at the workshop of the Assistant Agricultural Engineer (Research), Coimbatore :—

(1) *Cotton fineness testing device.*—Based on the principle of the fluid flow through a standard plug of cotton, a fineness testing device for cotton was designed and fabricated. Initial trials are encouraging. When completed with refinements, this may become a cheap and useful equipment for laboratory work.

(2) *Poultry trap nest.*—A poultry trap with automatic arrangement to shut the entrance as soon as the bird enters the nest was designed and fabricated. This is undergoing trials.

(3) *Sod cutter.*—The need for a labour saving device to cut the sods is very keenly felt in Soil Conservation Section. A device was therefore fabricated, based on the design and specifications obtained from Mr. Lloyd Signal, the Technical Co-operation Mission Expert attached to the Soil Conservation training centre at Ootacamund.

(4) *Sprinklers.*—Four numbers of sprinkler units on the model of the modern rotary rain monsters were fabricated. Preliminary trials revealed that they work very satisfactorily.

(5) *Light ploughs.*—A multi-purpose design suitable for use either as a plough or as a cultivator or ridger or a blade was manufactured. This is having very light draft and can be pulled by one animal. This implement is expected to be very useful for all light cultivation.

(6) *Modified bark remover.*—The previous model of the bark removing machine was modified by replacing the chains with mallets with turniped swing packing for the mallets which are hinged to the centre shaft. This modified design strips the bark very successfully at a rate of about 6 to 8 lb. per minute.

(7) *Potato harvester.*—A simple device like a ridge plough with fins for shaking off the soil, was designed and fabricated. This implement is expected to be useful for harvesting of potato crop which at present is done purely by manual labour in this State.

(8) *Hand duster.*—A new hand duster was manufactured out of 22 gauge Ms. G.I. sheets. It has two compartments connected by a rubber valve. One of the compartments is provided with a leather bucket portion screwed to a handle to serve as a plunger type air pump. A perforated tubing is provided in the other chamber to receive air from first compartment and to mix the powder in the second chamber and thus to create the necessary turbulence and eddies in the blast.

#### *Schemes financed by the Indian Council of Agricultural Research.*

The following two schemes were started to function during this period :—

(1) A scheme for the establishment of a research-cum-testing centre for bullock driven agricultural implements at Coimbatore was sanctioned in G.O. Ms. No. 4263, Food and Agriculture, dated 21st December 1959 till 29th February 1960 and subsequently continued in G.O. Ms. No. 1473, Food and Agriculture, dated 20th April 1960 till 31st March 1961. The object of the scheme is to test bullock driven machines and implements and design and develop suitable and efficient agricultural implements to serve the needs of the southern region.

(2) In G.O. Ms. No. 1126, Food and Agriculture, dated 23rd March 1960, Government sanctioned the scheme for survey of additional agricultural implements for one year from 1st April 1960 to 31st March 1961. The object of the scheme is to conduct a detailed survey of additional implements in common use in the country.

*Stock verification.*—The details of verification of Engineering stores verified by the Stock Verification Officer during the period are furnished below :—

(A) *Initial verification of Engineering Stores.*—(i) In the workshop stores of the Assistant Agricultural Engineer (Research), Coimbatore.

(ii) Tractor Servicing Centre, Tiruvarur.

(iii) Regional Stores, Tiruchirappalli.

(iv) Central Stores, Washermanpet.

(v) Government Industrial Engineering Workshop, Washermanpet.

(B) *Counter verification of Engineering Stores in the following offices :—*

(i) Regional Stores, Tiruchirappalli.

(ii) Tractor Servicing Centre, Tiruvarur.

(iii) Office of the Assistant Agricultural Engineer (Inspection), Madurai.

(iv) Office of the Assistant Agricultural Engineer (Inspection) at Sattur.

(v) Office of the Assistant Agricultural Engineer (Inspection), Tirunelveli.

(vi) Office of the Assistant Agricultural Engineer (Inspection), Kanyakumari.

(vii) Office of the Assistant Agricultural Engineer (Inspection), Nilgiris.

(viii) Office of the Assistant Director (Drilling), Coimbatore.

(C) *Besides, in the following offices initial and counter verification was done by the Joint Director of Agriculture (Engineering).*—(i) Office of the Assistant Agricultural Engineer (Inspection), Tiruchirappalli (counter verified).

(ii) Office of the Assistant Agricultural Engineer (Inspection), Saidapet (assisted to complete initial verification).

(iii) Office of the Assistant Agricultural Engineer (Inspection), Cuddalore (counter verification).

(iv) Regional Stores at Saidapet (initial verification).

(v) Office of the Assistant Agricultural Engineer (Research), Coimbatore (initial verification).

(vi) Office of the Assistant Agricultural Engineer (Inspection), Coimbatore at Nilgiris (counter verification).

#### XIV. SOIL CONSERVATION.

In recent years soil conservation has been recognised as a subject of national importance since it is out of the basis for intelligent land use and for conservation of moisture and soil on a long range plan. Soil erosion had been an acute problem in many of the districts in Madras State, but its seriousness has been realized only recently. This was in a large measure due to the increasing demand for cultivation of land which lead people to break up virgin areas or slopes and vulnerable sites causing serious erosion on a large scale. Under the drive for increased food production, wooded areas and marginal lands were stripped of their old protective vegetable cover and brought under the plough for intensive cultivation of potatoes, on steep slope in the Nilgiris district. A beginning has also been made with the same crop in the Kodaikanal region without necessary protective safeguards to prevent erosion of the soil. Soil erosion had in consequence become a very serious menace in such intensively cultivated areas and particularly so in the Nilgiris district, where this crop has been increasingly cultivated.

2. During the year 1959-60, Soil Conservation Schemes were under execution in the districts of North Arcot, South Arcot, Coimbatore, Salem, Chingleput, Nilgiris, Madurai and Tiruchirappalli.

3. It has been found in experience that dry farming measures combined with contour bunding operation raised the yield by 50 per cent. Accordingly Dry Farming Schemes have since been commenced in Coimbatore and Madurai districts, for demonstrating the improved methods of agriculture suited to low rainfall areas combined with suitable soil conservation methods. The scheme for conducting trials of biological measures in soil conservation works has also since been started. The results expected to be achieved in this research work will go a long way to help the ryots in the choice of grasses and legumes for protecting the land bunds and terraces. The Government have also sanctioned the post of one Assistant Agricultural Engineer in the Agronomy Section of the Agricultural College and Research Institute, Coimbatore, to conduct research on agronomical aspects pertaining to soil conservation.

4. With a view to accelerate the pace of progress the Government have established a training centre at Coimbatore to impart both theoretical and practical training to the Sub-Assistants in Soil Conservation for a period of six months and after successful completion of training, they will be appointed as Sub-Assistants in the regular Soil Conservation Schemes. So far two batches of 24 Sub-Assistants each have already been trained and the third batch is undergoing their training at Coimbatore.

5. The progress made in the execution of soil conservation schemes during 1959-60 is reviewed below :—

*Nilgiris district (Ootacamund subdivision)—(a) Pilot soil conservation scheme in an area of 88.65 acres.*—Sanctioned in G.O. Ms. No. 3792, Development (Planning and Development), dated 25th February 1952.

The various soil conservation works under this scheme were completed on 31st July 1954. The record of rights and liabilities was prepared and published. The recoveries of the instalments towards the cost of soil conservation measures executed are being made by the Revenue authorities.

*(b) Extension Soil Conservation Scheme in an area of 203.35 acres in Ketty Valley.*—Sanctioned in G.O. Ms. No. 4821, Development (Planning and Development), dated 31st October 1953.

All the works contemplated under this scheme have been completed on 6th November 1955. The record of rights and liabilities was prepared and published. The recovery of dues from the beneficiaries are being made by the Revenue authorities.

*(c) Kammandhu Soil Conservation Scheme in an area of 201.41 acres.*—Sanctioned in G.O. Ms. No. 626, Agriculture, dated 9th March 1955.

The soil conservation works under this scheme was completed on 29th October 1956. The record of rights and liabilities has been prepared and published on 25th April 1959 at the District Collector's office, Taluk Office, Coonoor, and Village Chavadi, Ketty.

The recovery of instalments from the beneficiaries are being made by the Revenue authorities.

*(d) Execution of soil conservation works on the lands proposed to be assigned to Harijans and others.*—The execution of soil conservation works on the lands proposed to be assigned to Harijans were temporarily stopped from October 1959 as per Director of Agriculture's SC. No. 3. 66/58, dated 8th October 1959. An area of 5.05 acres was covered during the fasli year bringing the progressive total to 113.16 acres from the initiation of the schemes.

*(e) Special Comprehensive Soil Conservation Scheme in 5,000 acres in the entire Nilgiris district.*—Sanctioned in G.O. Ms. No. 257, Agriculture, dated 3rd February 1956.

The Special Comprehensive Soil Conservation Scheme was in operation from 15th March 1956 and came to a close on 31st March 1960 covering an area of 5,516.05 acres for the whole district. Out of this acreage, 624 acres are brought under soil conservation measures by the technical advice given by this department. The farmers take up their work with their own finance. The work under this scheme was ordered to be implemented outside the purview of

the Madras Land Improvement Scheme (Contour Bunding and Contour Trenching) Act, 1949, by obtaining consent statements from the farmers in whose lands the soil conservation measures are to be executed. The beneficiaries have to pay 75 per cent of the cost of works, 100 per cent of cost of establishment and contingent charges and 10 per cent of cost of machinery and equipment.

*(f) Scheme to tackle 1,500 acres in Nilgiris district during 1960-61.*—Sanctioned in G.O. Ms. No. 1210, Food and Agriculture, dated 26th March 1960.

The scheme to tackle 1,500 acres in the Nilgiris district during 1960-61 was commenced on 1st April 1960 in Ootacamund and Coonoor subdivisions. The monthwise achievement under this scheme is furnished below :—

*Statement showing the area covered in each month (in acres) in Ootacamund subdivision from 1st July 1959 to 30th June 1960.*

| Serial number and month.<br>(1)                                                            | Target. Achievement.<br>(2) (3) |          |
|--------------------------------------------------------------------------------------------|---------------------------------|----------|
|                                                                                            | ACS.                            | ACS.     |
| <b>Special Comprehensive Soil Conservation Scheme in 5,000 acres in Nilgiris district—</b> |                                 |          |
| 1 July 1959 .. .. .                                                                        | 35                              | 37.15    |
| 2 August 1959 .. .. .                                                                      | 35                              | 43.43    |
| 3 September 1959 .. .. .                                                                   | 80                              | 78.07    |
| 4 October 1959 .. .. .                                                                     | 125                             | 125.29   |
| 5 November 1959 .. .. .                                                                    | 125                             | 157.33   |
| 6 December 1959 .. .. .                                                                    | 110                             | 147.08   |
| 7 January 1960 .. .. .                                                                     | 70                              | 106.17   |
| 8 February 1960 .. .. .                                                                    | 60                              | 114.44   |
| 9 March 1960 .. .. .                                                                       | 40                              | 120.51   |
| <b>Scheme to tackle 1,500 acres in Nilgiris district during 1960-61—</b>                   |                                 |          |
| 10 April 1960 .. .. .                                                                      | 50                              | 49.45    |
| 11 May 1960 .. .. .                                                                        | 35                              | 52.42    |
| 12 June 1960 .. .. .                                                                       | 35                              | 51.04    |
| Total .. .. .                                                                              | 800                             | 1,082.43 |

\* Total of area covered by piece work contract, Departmental tractor bull, dozers, and manual labour of the ryots themselves under technical aid of this Department.

*Other works—(a) Training of farmers in simple method of soil conservations.*—Sanctioned in G.O. Ms. No. 3928, Food and Agriculture, dated 1st December 1958, and G.O. Ms. No. 1358, Food and Agriculture, dated 23rd March 1959.

The scheme for imparting training to farmers in simple soil conservation methods sanctioned in Government Order quoted above was kept in abeyance from 1st April 1959 to 30th June 1959 and was revived on 1st July 1959.

The scheme was continued for six months and six batches of farmers totalling 170 were successfully trained. The monthwise particulars of farmers trained are furnished below :—

| Month.                 | Number of<br>farmers trained. |
|------------------------|-------------------------------|
| July 1959 .. .. .      | 15                            |
| August 1959 .. .. .    | 27                            |
| September 1959 .. .. . | 36                            |
| October 1959 .. .. .   | 32                            |
| November 1959 .. .. .  | 31                            |
| December 1959 .. .. .  | 28                            |
| <b>Total ..</b>        | <b>170</b>                    |

(b) *Training of Sub-Assistants.*—During the period under report two batches (six candidates for each batch) of Soil Conservation Sub-Assistants were given training in soil conservation practices of hilly region.

Practical training in Agricultural Engineering for a period of two months was given to one trainee and another one is undergoing the training and will complete it in August 1960.

#### SOUTH ARCOT DISTRICT.

The Soil Conservation Scheme in Kadambuliur firka of South Arcot district sanctioned in G.O. Ms. No. 1006, Food and Agriculture, dated 5th March 1960, for undertaking soil conservation works in 4,000 acres was implemented during the financial year 1959-60. The target of 4,000 acres was increased to 5,320 acres as per G.O. Ms. No. 3405, Food and Agriculture, dated 29th September 1959, by adding the balance area that was not completed in the previous year. From January 1960 onwards, another 2,000 acres was allotted to be tackled. Thus, out of the total target of 7,320 acres, only 6,484 acres were contour bunded from 1st April 1959 to 31st March 1960.

From April 1960 onwards the South Arcot and Chingleput districts Soil Conservation Scheme with a target of 6,000 acres sanctioned in G.O. Ms. No. 1210, Food and Agriculture, dated 26th March 1960, was taken up for executing soil conservation measures. Till the end of June an area of 733.91 acres have been tackled.

#### CHINGLEPUT DISTRICT.

The Trivellore Soil Conservation Scheme in Chingleput district sanctioned in G.O. Ms. No. 3958, Food and Agriculture, dated 3rd December 1958, was continued up to 31st August 1959 in accordance with the G.O. Ms. No. 1360, Food and Agriculture, dated 23rd March 1959. Within the time specified the balance target of

1,440.37 acres could not be achieved. So sanction was accorded for further continuance of the scheme up to 31st December 1959 in the G.O. Ms. No. 3527, Food and Agriculture, dated 7th October 1959 and again up to 31st March 1960 in G.O. Ms. No. 415, Food and Agriculture, dated 10th February 1960. Within the period of sanction an area of 1,885.79 acres was contour bunded including the balance of 1,440.37 acres that were left over before.

In the G.O. Ms. No. 1092, Food and Agriculture, dated 11th March 1959, a soil conservation scheme was sanctioned with a target of 2,200 acres for Tiruvallur taluk of Chingleput district during the year 1959-60. As the staff employed in this scheme was deputed to undergo soil conservation training at Ootacamund and others transferred to Panruti from January 1960 to tackle the additional area of 2,000 acres allotted to the Kadambuliur scheme, the target could not be achieved.

#### DRY-FARMING SCHEME—COIMBATORE DISTRICT.

With a view to increasing the yield by 50 per cent by the intensification of the adoption of dry farming measures and contour bunding works, the Government of India proposed that 40 demonstration projects on a water-shed basis in an area of about 1,000 acres each, should be undertaken during 1959-60 and 1960-61 in all the States, and allotted two such projects in this State.

In G.O. Ms. No. 4188, Food and Agriculture, dated 12th December 1959, the Government approved the proposals of the Director of Agriculture to establish two projects in Madras State one at Palladam in Coimbatore district and another at Batlagundu, Madurai district at an estimated cost of Rs. 1,09,900 (Rupees one lakh nine thousand and nine hundred only) for a period of two years for each project.

#### OBJECT OF THE SCHEME.

1. Intensification of the adoption of dry farming measures and contour bunding.
2. To get information on comparative crop yields in the watershed in which soil conservation work has been effected and others without it for five years.
3. By proper equipments, measure automatically the run off and soil loss.

The expenditure on the project will first be met from State funds and will be reimbursed in full by the Government of India as centrally sponsored scheme. The expenditure on the project will be initially debited to "Scheme for intensification of the adoption of contour bunding and dry farming measures in Coimbatore and Madurai districts".

**Scheme area.**—The selected area for the project work extends over 1,188 acres in Palladam taluk, Coimbatore district, with a ridge line all round and is about 23 miles from Coimbatore on the Coimbatore-Palladam road. The lands solely belong to the private parties. The soil is red loam with depth varying from 4 inches to 1 foot.

**Soil Conservation Work done.**—From April 1960 to 30th June 1960 agreements were obtained for 941.46 acres from the ryots in the form prescribed by the Government of India in their letter No. 20-12/59-SC(P), dated 11th September 1959 and 88.16 acres were aligned and contour bunded.

**Equipments.**—Proper equipments will be obtained from the Government of India for recording the run off and soil loss. Eighteen sets of dry farming implements will be purchased to carry on dry farming measures in an intensified manner after contour bunding to increase the yield.

#### SALEM DISTRICT.

In G.O. Ms. No. 1043, Food and Agriculture, dated 9th March 1958, a scheme for carrying out soil conservation measures in 2,000 acres in Marappanaickenpatty and Kondireddipatty villages of Mathur firka, Krishnagiri taluk, was sanctioned.

The scheme in Padapalli, Perumalkuppam and Virigampalayam villages under the style Perumalkuppam scheme was sanctioned in G.O. Ms. No. 1339, Food and Agriculture, dated 11th April 1958, for the year 1958-59.

**Progress of work done.**—At the beginning of the introduction of soil conservation scheme, there was much opposition for bunding work in the villages and great difficulties were experienced in getting consent statements from the ryots. There was a great failure of rains in respect of bunding works during the period from April to June and the progress in this respect was seriously affected. In some areas, there was scarcity for labour, which caused the slow and poor progress at the first instance.

Due to intensive propaganda made, the resistance to soil conservation measures were reduced by the end of the year and the consent statements were obtained for 4,871.80 acres.

During the second and the third quarters (July to December) the entire area was covered with crops and hence no progress could be made under bunding. During the last quarter (January to March 1960). 655.63 acres were bunded.

Since up to June 1959, only 200.41 acres were bunded and since the area bunded was only at the ridges of various sub-catchments, no waste weirs or checkdams were found essential in the area. During the last quarter (January to March) full attention was paid to bunding work, checkdams, and waste weirs could not be constructed in 1959-60.

**Achievements.**—The work done during the period in respect of each item of work is furnished below :—

Bunding—2,255.95 acres.

Consent statements obtained—4,871.80 acres.

Area surveyed—1,255.25 acres.

Gully plugging—21 Nos.

Estimates prepared—1,968.18 acres.

Level and contour lines fixed for estimate—918.06 acres.

#### Reasons for the short fall.

1. Almost all the area was sown with millet and pulse seeds.
2. The labour scarcity in this area mainly affected the progress of work.
3. The piece workers were not enthusiastic and they were not engaging more labour, since they wanted a higher rate.
4. The scheme was started in July which is the cropping season for the year.

**Nilgiris district (Coonoor Division)**—Work done during the previous fasli year.—Soil conservation measures were carried out in this subdivision by engaging piecework contractors, departmental labour and tractor bull-dozer during the previous year. No tender contractor was engaged as it was expected there would be opposition for execution of works by outsiders and also due to the presence of too many pattadars in one field. Contour trenching and bench terracing were the main items of the soil conservation works executed. In addition to this, technical assistance was extended to enterprising ryots who did the works at their own cost.

**Work done during the period under report.**—The Government have ordered the execution of soil conservation works outside the scope of the Madras Land Improvement Act so as to overcome the time spent on observing the many formalities laid down in the above Act, after getting consent statements in Rs. 1.50 nP. stamp paper from the pattadars. Further the provision of the Madras Hill Station (Preservation of Trees) Act, 1955, was taken advantage of for compelling the land owners in the urban areas of Coonoor and Kotagiri to carry out soil conservation works. But unfortunately much area was not available in these two places as the area under potato cultivation was not even 1,000 acres in both the above places. It has been proposed for the extension of this Act to all the Panchayats of the Nilgiris as every part of the Nilgiris is equally important to preserve the scenic beauty of the hills.

The Soil Conservation measures executed included contour trenching, bench terracing and disposal drains for satisfactory drainage of excess water.

Contour trenching was carried out in lands having slope steeper than 1 in 3 for planting perennial crops like tea, coffee, wattle, blue gum, etc. At every 250 to 300 feet length of the trenches vertical drains of suitable dimension were constructed for disposal of excess water, with drop pits.

Grass planting work in the vertical faces of terraces was attended to in a few places where there was no natural growth of grass and this too was done by technical advice and supply of improved species of grass slips to the ryots and not at departmental cost.

Surveying and plotting of fields were undertaken by the staff for preparation of records of rights and liabilities.

The progress achieved during the period under report is furnished below :—

|                                                 | ACS.   |
|-------------------------------------------------|--------|
| Total area covered under bench terracings ...   | 373.25 |
| Total area covered under contour trenchings ... | 115.47 |
| Total area surveyed ...                         | 265.86 |

*Area covered by the ryots under technical advice.*

|                                          |       |
|------------------------------------------|-------|
| Area covered under bench terracing ...   | 6.45  |
| Area covered under contour trenching ... | 45.00 |

*Benefits of soil conservation measures in terms of money value.*

|                                                |              |
|------------------------------------------------|--------------|
| Normal yield of potato per acre ...            | 10,000 lb.   |
| Increase in yield due to contour trenching ... | 20.51 tons.  |
| Bench terracing ...                            | 303.76 tons. |

*North Arcot district—Progress of work done in various schemes.*

1. *Pallalakuppam scheme subsequently merged with North Arcot District Scheme from 1st April 1960*—(i) *Pallalakuppam scheme*.—The area targetted to be tackled in 1959-60 was 1,407 acres. The scheme was started on 1st April 1959. Till 30th June 1959 an area of 230.89 acres were brought under contour bunding and during the period from 1st July 1959 to 30th June 1960 the rest of the targetted area of 1,170.11 acres under contour bunding, levelling and trenching, etc., was achieved in full. A brief skeleton of work done during the year is as follows :—

|                         | Target. | Achievement. |
|-------------------------|---------|--------------|
|                         | ACS.    | ACS.         |
| Contour bunding .. ..   | 1,401   | 1,130 55 1   |
| Contour trenching .. .. | ..      | 7 33         |
| Chain survey .. ..      | ..      | 346 80       |
| Gully plugging .. ..    | ..      | 40 Nos.      |

| Target.                       | Acs. | Achievement. |
|-------------------------------|------|--------------|
| Waste weirs .. ..             | ..   | 1 No.        |
| Checkdams .. ..               | ..   | 8 Nos.       |
| Diversion drain .. ..         | ..   | 7,969 R. ft. |
| Levelling by bull-doser .. .. | ..   | 31-63        |
| Pathroad formation .. ..      | ..   | 5,688 "      |
| Area surveyed for estimate .. | ..   | 674-84       |

(ii) *North Arcot District Scheme*.—The target fixed for North Arcot District scheme is 6,000 acres. The scheme was sanctioned in G.O. Ms. No. 1210, Food and Agriculture, dated 26th March 1960. The work was started in four centres of Wallajah, Gudiyatham, Tirupattur and Chetput with effect from 1st April 1960 and working in one more centre is to be started yet. The details of work turned out are as follows :—

|                         | Target. | Achievement. |
|-------------------------|---------|--------------|
| 1 Contour bunding .. .. | 6,000   | 1,829 00     |
| 2 Levelling .. ..       | ..      | 5 70         |
| Total ..                | ..      | 1,934 70     |

2. *Salem District Scheme*—(i) *Perumalkuppam scheme in Harur taluk of Salem district*.—Originally the scheme was sanctioned in 1958-59. The targetted area of the scheme is 2,000 acres. The scheme was sanctioned at the first instance in G.O. Ms. No. 1399, Food and Agriculture, dated 11th April 1958. Since the target was not achieved in 1958-59, further continuance for one year from 1st April 1959 to 29th February 1960 was accorded in G.O. Ms. No. 1015, Food and Agriculture, dated 5th March 1959.

During the year under review an area of 811.21 acres were brought under contour bunding. The scheme has been merged with Salem district scheme of 6,000 acres with effect from 1st April 1960. *vide* G.O. Ms. No. 1210, Food and Agriculture, dated 26th March 1960.

(ii) *Marappanaickenpatti scheme*.—This scheme has been sanctioned in G.O. Ms. No. 1043, Food and Agriculture, dated 9th March 1959. The targetted area fixed for the scheme is 2,000 acres. This scheme has been started on 1st April 1959. As against a target of 2,000 acres, an area of 1,076.71 acres were achieved up to 31st May 1960. This scheme has also been merged with Salem district scheme with effect from 1st April 1960.

II. *Salem District Scheme—Target 6,000 acres*.—This scheme consists of five centres. Each centre consists of 1,200 acres. The details of the centres are two centres and Perumalkuppam village, two centres at Marappanaickenpatti village and one centre at Sankari village.

During the year under review, an area of 305.37 acres were achieved under Salem District schemes in addition to the area achieved under Perumalkuppam and Marappanaickenpatti scheme as detailed in the foregoing paragraphs.

Even though the progress of work in respect of the new district set up of staff appears to be satisfactory in view of the fact that an area of 1929 acres have been covered from 1st April 1960 to 30th June 1960 with only three-fifth of executive staff, much could be done if the scheme is arranged to be sanctioned for the fasli year, i.e., from July to June of every year as it would be possible to utilise the full season for bunding continuously and continued programme of work would help in greater out-turn. Non-availability of Executive staff in full strength has much affected the progress in the new district set up of work. The ryots have to be educated on the benefits of the scheme and much preparatory work has to be done to get the response from the ryots in all the places wherever the scheme was started newly. Once the ryots are convinced, the difficulties in execution are overcome to a certain degree. The real difficulty therefore is to convince the ryots in every place wherever the work is started for the first time. The work is to be executed only after obtaining consent statements from the beneficiaries outside the purview of the Land Improvement Act, 1959. If this Act is enforced better progress would be possible. Non-availability of labour required for the new pattern of district set-up has been solved. In addition if supply of bull-dozers to soil conservation scheme, is made expeditiously available, the progress could be speeded up.

Soil conservation work so far as this district is concerned is only seasonal. The lands for carrying out conservation work become available only for a small period of five months in the year. Even this period is available in two bits when compared with the period of sanction of schemes. Much work could be done if arrangements are made to get the scheme sanctioned so as to utilise the full bunding season continuously from February to June of every year.

Of late people are much attracted in the construction of surface storage tanks, checkdams, etc. But such constructions could not be encouraged in view of their high cost towards construction and subsequent recovery from the poor agriculturists. If the recovery towards such constructions is liberalised the scheme would gain appreciation and record better progress.

*Tiruchirappalli District—Scheme Work.*—The Schemes were under operation in Tiruchirappalli district as detailed below:—

Samayapuram Scheme from 1st March 1959 to 31st March 1960.

Sakkanam Scheme from 2nd July 1959 to 31st March 1960.

Tiruchirappalli Scheme (New Scheme) from 1st April 1960 in progress.

(a) *Samayapuram Scheme.*—Out of 2,500 acres of target fixed, 2,616 acres were covered in Vengaikurichi, Avaranpatti, Chettiapatti and Irungalur villages.

(b) *Sakkanam Scheme.*—Out of 2,500 acres of target fixed, 1,260 acres were covered in Sakkanam and K. Pichanpatti villages up to 31st March 1960.

(c) *Maintenance Scheme (Adhanakottai Scheme).*—Only maintenance work was carried out by one Soil Conservation Assistant and one Special Revenue Inspector.

The new scheme (in Tiruchirappalli district) is functioning from 1st April 1960 and out of target of 6,000 acres fixed for the year 1960-61, 3,713 acres were achieved up to the end of June 1960.

#### MADURAI DISTRICT.

*Scheme for the intensification of the adoption of contour bunding and dry farming measures in Batlagundu.*—The object of the demonstration project is to demonstrate to the people what can be achieved, by soil conservation measures including dry farming as an aid to step up food production on a complete water shed basis comprising of agricultural lands of medium soils.

The catchment selected lies in the rainfall area having an annual average of 34 inches. The total area selected is 1036.37 acres comprising of private agricultural lands of red loam and sandy soils with gravelly sub strata.

A controlled water shed nearby having similar conditions where no soil conservation measures have been or proposed to be introduced in the near future has also been selected in order to collect information as regard crop yield so as to assess the quantum of additional production that they may be expected as well as to find out the effect of improved implements on crop production through more timely and better cultural operations.

Both these blocks will be equipped with measuring devices at suitable place to measure automatically the run off and soil loss.

The maintenance of the soil conservation works will be looked after by the Government agency during the construction stage while later, in the maintenance works including the fallow on dry farming practices shall have to be looked after by the beneficiaries themselves at least for a period of ten years. For this purpose a written agreement is taken from the beneficiaries.



*Soil conservation measures proposed to be undertaken—*

1. Contour bunding over 966 acres.
2. Carrying out suitable soil conservation measures, pasture development, checkdams and afforestation on the remaining 89.39 acres.
3. Carrying out dry farming measures such as—
  - (a) Contour cultivation (harvesting, sowing and inter-cultivating on contours).
  - (b) Use of improved seeds and manures.
  - (c) Proper seed rate and spacing.

*Soil conservation work done.*—The scheme commenced working after joining of the Assistant Agricultural Engineer on 6th June 1960. During the period under report only preliminary arrangements were made to start the scheme like preparation of maps, identification of survey fields, collection of names of pattadars, present enjoyers, extent cultivated, crops grown, local agricultural practices, water table, yield, etc. The owners were contacted and aim of the scheme explained to them and arrangements were made for the purchase of stamp papers. Arrangements were also made for the supply of improved seeds suited to the locality and for the manufacture and supply of implement like improved seed, drill, blade hoe, tyre tooth hoe and covering harrow. Arrangements were also made for the supply of mathematical and survey instruments for the starting of the survey work and for the purchase of rain-gauge and stage level recorders.

*Soil Conservation Work done.*—The need for soil and water conservation for wise land use so as to keep it permanently productive has long been felt by the farmers and the technicians as well. Out of the net area of 1.3 million acres sown, only 30 per cent are commanded by irrigation, and the rest 70 per cent of the area still remains a gamble in the monsoon.

The Soil conservation measures proposed for the area are as follows in Athur and Batlagundu schemes—

- Contour bunding.
- Reclamation of gullies.
- Contour trenching and afforestation.
- Construction of waste weirs and check dams.
- Improved dry farming practices.
- Contour cultivation with improved strains, seeds, judicious manuring and plant protection, etc.

In hilly region in Kodaikanal, the following soil conservation measures are adopted :—

- Bench terracing.
- Construction of retaining walls.
- Contour trenching and afforestation.

In the sand dune control scheme at Bodinaickanur, it has been proposed to raise wind belts by planting Agave suckers, Prosopis, tamarind, etc., in seven rows across the direction of the wind and maintain them to check the drifting of the sand by wind.

The details of target fixed and achievement made under each scheme are furnished below :—

| Name of Scheme.           | From 1st July 1959 to 31st March 1960. |                                                    |                    |
|---------------------------|----------------------------------------|----------------------------------------------------|--------------------|
|                           | Target.                                | Achievement from 1st July 1959 to 31st March 1960. | Total achievement. |
| (1)                       | (2)                                    | (3)                                                | (4)                |
| 1 Athur scheme .. .. .    | 3,000                                  | 1,051                                              | 2,482              |
| 2 Batlagundu scheme .. .  | 3,000                                  | 991                                                | 1,061              |
| 3 Kodaikanal scheme .. .  | 250                                    | 157                                                | 206                |
| 4 Bodinaickanur Scheme .. | 16 miles.                              | 4-1/2 miles.                                       | 4-1/2 miles.       |

*From 1st April 1960 to 31st June 1960.*

|                                                                                        |           |              |              |
|----------------------------------------------------------------------------------------|-----------|--------------|--------------|
| 1 Soil Conservation Scheme executed on a district wise basis in Madurai district.      | 5,000     | 3,299        | 3,299        |
| 2 Schemes for checking of sand dunes spreading to agricultural lands in Bodinaickanur. | 12 miles. | 2-3/8 miles. | 2-3/8 miles. |

*Reasons for shortfall*—1. *Athur Scheme.*—In the Athur scheme, an area of 2,482 acres was covered against a physical target of 3,000 acres. The main bottleneck was soil conservation work in the plains in Madurai district being a new venture and intensive propaganda had to be carried out to make the ryots soil and water conservation minded. There was also scarcity of labour. The soil also was quite hard and this scared the labourers. As such, the desired progress could not be achieved. As regard the financial target, there was a shortfall due to the reason that the estimates for soil conservation works were based on Public Works Department schedule of rates. In actual execution, it was found that works could be executed at lesser cost. In the scheme, provision has been made for incurring an expenditure of Rs. 45 per acre but in actual working the cost of bunding per acre worked out to round about Rs. 30 per acre. Hence the shortfall.

2. *Batlagundu scheme.*—Against a target of 3,000 acres for this scheme an area of 1,061 acres alone was covered. The scheme was started in June 1959 towards the fag end of the bunding season. The full compliment of the staff for the scheme joined only in June 1959 (i.e.) just when the sowings commenced. Besides there had been frequent changes in the staff. As such, the shortfall could not be avoided. This shortfall reflected in the financial achievement also.



8. *Kodaikanal Scheme*.—Against a target of 250 acres for bench terracing only 206 acres have been covered. The main bottlenecks are—

- (i) unwillingness of ryots.
- (ii) acute scarcity of labour.
- (iii) non-availability of piece work contractors.
- (iv) non-availability of lands.

In Kodai hills unauthorized cultivation has been going on and as such, all the lands under cultivation could not be tackled. Such of those lands which are assigned are being tackled with the help of Revenue department.

*Bodi Scheme*.—The main bottlenecks were want of sufficient planting material and difficulty in engaging mazdoors at the low rate of Rs. 30 per month sanctioned in the scheme.

## XV. LEGISLATION AND STATISTICS.

*Weekly cotton mill and press ginning returns*.—The ginning and pressing factories and the mills are continuing to send the weekly returns on the statistics relating to the cotton ginned and pressed and these statements are being consolidated at the state level and published in the *Fort St. George Gazette* in accordance with section 5 of the Ginning and Pressing Factories Act, 1925. Copies of these weekly data are also sent to the Economic and Statistical Adviser to Government of India, New Delhi, Indian Central Cotton Committee, Bombay and the Secretary, East India Cotton Association, Bombay. Necessary instructions are also issued from time to time to the factory owners for submission of the weekly returns promptly on the due dates. The District Agricultural Officers have also been instructed to check the factories in regard to the submission of returns.

### COTTON TRANSPORT ACT.

(a) *Annual general licence*.—During the period under report 122 licences with 3,773 certified copies were issued to the Cotton Mills for the transport of ginned cotton for the purpose of manufacture. The corresponding figures for the previous year are 121 licences and 4,750 certified copies (1st July 1958 to 30th June 1959).

(b) *Single licence by Sea*.—During the period 175 licences were issued for the transport of 35,097 bales of ginned cotton for the purpose of spinning as against 309 licences and 81,713 bales last year (1st July 1958 to 30th June 1959).

(c) *Single licence by Rail*.—Four licences were issued during the period for the transport of 15 bales of cotton for the purpose of spinning as against 30 licences issued last year (1st July 1958 to 30th June 1959) for the transport of 442 bales.

(d) *Single licences by Road*.—During the period 3,153 licences were issued for transport by road 84,714 bales of cotton for the purpose of manufacture. In the previous year 2,131 licences were issued for transport of 78,703 bales of cotton (1st July 1958 to 30th June 1959).

N.B.—A bale of cotton is 392 lb. nett.

*Object of the Scheme*.—The Fertiliser Control Order, 1957, is being implemented in this State from 1st September 1957. The order provides for the licensing of dealers, the registration of mixed fertilizers, inspection, taking and analysing of manure samples for the control of quality. Prevention of the sale of spurious fertilizers, adulteration of fertilizers and enforcing the sale of fertilizers at fair prices are the main objects of the scheme. The Agricultural Demonstrators and the Extension Officers (Agriculture) act as Fertiliser Inspectors in their jurisdictions and the District Agricultural Officers act as Licensing Authorities and the Director of Agriculture, Madras, is the registering authority for registering mixtures of fertilizers.

*Control of Quality*.—The total number of licences issued including renewals and the total amount collected towards licence fees and the expenditure during the period under report are as follows:—

Total number of licences issued—2,872.

|             |     |     |     |                                |
|-------------|-----|-----|-----|--------------------------------|
| Receipt     | ... | ... | ... | Rs. 59,276-97 nP.              |
| Expenditure | ... | ... | ... | Rs. 54,162-44 nP.<br>(roughly) |

Eighty-three registration certificates were issued registering 160 mixtures.

The retail prices for the registered mixture have been fixed and notified in *Fort St. George Gazette* for price control. Four hundred and sixty samples of both straight and mixed fertilizers have been taken and sent to Coimbatore for analysis by the Inspectors for quality control.

Forty-five cases of contravention of the Fertilizer Control Order were detected and prosecutions have been launched against the defaulters in the court of law where necessary.

### THE MADRAS AGRICULTURAL PESTS AND DISEASES ACT.

This Act was enforced in respect of "Stem Weevil" and "Pink Boll-worm" pests of Cambodia and Pachanadam cotton in Madurai, Coimbatore, Tiruchirappalli and Salem districts during 1959-60 (up to 31st March 1960) as per G.O. Ms. No. 2834, Food and Agriculture, dated 30th July 1959 and G.O. Ms. No. 4023, Food and Agriculture, dated 25th November 1959. The notification of the Act was proclaimed by beat of tom-tom in the

villages in collaboration with the Revenue Department. Wide publicity and intensive propaganda were undertaken for bringing home to the ryots, the provisions of the Act and its importance.

Intensive touring was undertaken by the Agricultural Demonstrators, Extension Officers and other field staff and every step was taken to completely pull out Cambodia and Pachanadam cotton and no crops of exotic cottons was allowed to stand in the field after 1st September 1959. No exemption was granted to the ryots from the operation of the provision of the Act.

The enforcement of the Act is being continued during 1960-61 also as per G.O. Ms. No. 2415, Food and Agriculture, dated 13th July 1960.

This Act was enforced during 1959-60 (up to June 1960) in respect of Red Hairy Caterpillar pest on groundnut in North Arcot, South Arcot, Salem, Coimbatore, Madurai and Ramanathapuram districts and in the taluks of Pattukkottai, Thiruthurai-poodi, Mannargudi, Orathanad, Nagapattinam and Arantangi comprising the Pattukkottai and Thanjavur Agricultural Divisions of Thanjavur district as per G.O. Ms. No. 3436, Food and Agriculture, dated 3rd October 1959.

As a first step towards the implementation of the Pest Act, wide publicity and intensive propaganda were undertaken. The plant protection staff and other Agricultural field staff toured the affected villages intensively and explained to the ryots the importance of timely control measures. Demonstrations in the control of Red Hairy Caterpillar were also carried out in the pest-affected areas. Adequate quantities of pesticides were stocked in the Agricultural depots to meet the situation and pesticides were issued to ryots at 50 per cent concessional rates. As a result of the efforts of the Department the ryots in the pest-affected areas adopted the recommended preventive and control measures. The enforcement of the provision of the Pest Act in respect of the Red Hairy Caterpillar pest on groundnut on the whole proved beneficial to the ryots during last year.

The enforcement of the Act is being continued during 1960-61 also as per G.O. Ms. No. 2798, Food and Agriculture, dated 11th August 1960.

The Madras Agricultural Pest and Diseases Act, 1919, was enforced on 4th March 1959 in the Pugalur Sugar Factory area and continued throughout the period of the year with one Special Agricultural Demonstrator, five Fieldmen and ten Demonstration Maistris. Mechanical control measures were adopted by the Pest Act Staff for eradicating the smut-affected clumps, early shoot borer and top shoot borer on sugarcane with the assistance of the factory staff and ryots.

## XVI. SPECIAL FEATURES OF WORK DONE IN THE DISTRICTS.

*South Arcot.*—There was an average rainfall of 892 m.m. This was far below the normal for the district. South-west monsoon showers were late and scanty in the Cuddalore division and summer showers were disappointing in Villupuram division. Four thousand two hundred and fifty-four acres of land were ploughed by tractors. One thousand seven hundred and four tons of primary and village seed farms seeds of paddy were distributed to cover an area of 82,720 acres, 324 tons of g.m. seeds were distributed covering an area of 24,518 acres. Sixty-two filter points were sunk; 165,730 acres were planted under Japanese method. Fifteen State Seed Farms functioned in the district during the year.

*Salem.*—The seasonal conditions were below normal, summer and south-west monsoon showers were meagre and north-east monsoon was delayed. An annual rainfall of 833.6 m.m. inches was received. Ten State Seed Farms functioned during the year and three others were closed. Nearly 1,508 tons of primary and village seed farm seeds of paddy strains were distributed among ryots to cover an area of 75,470 acres. Eighty-one tons of green manure seeds to cover an area of 9,233 acres were distributed during the year. A total area of 44,786 acres of food and non-food crops were tackled against various pests and diseases. Sixty-nine thousand five hundred and twenty-five acres were covered during the year under Japanese method of paddy cultivation. Five filter points were sunk.

*Chingleput.*—There was an average rainfall of about 909.3 m.m. The rainfall was below normal. Although the main season sowings were completed in July 1959, the young crops suffered due to drought in August. The main season sowing of paddy was delayed due to want of rain in time. Summer showers were few and scanty and the crops were affected adversely. Three thousand eight hundred and twenty-seven tons of paddy seeds were distributed to cover an area of 170,534 acres. One hundred and fifty-seven tons green manure seeds covering an area of 25,489 acres was distributed. A total area of 171,068 acres of paddy was planted under Japanese method. Seven State Seed Farms functioned in the district during the year. Special schemes for increased vegetable production continued to be in operation in Madras City. In Guindy division alone 717 lb. of vegetable seeds were distributed. Eleven filter points were sunk. An area of 200,178 acres was tackled against pests and diseases.

*North Arcot.*—An average rainfall of 732.4 m.m. was received during the year. This was far below the normal and as a consequence, the agricultural season for the district was practically a failure. Nearly 160 tons of green manure seeds were distributed, covering an area of 31,978 acres. One thousand three hundred and forty-six tons of paddy seeds of strains were distributed to

cover an area of 75,628 acres. Fourteen State Seed Farms functioned during the year. One lakh and seventy-two thousand one hundred and sixty-five acres of paddy crop were planted under Japanese method. Seventy filter points were sunk. A total area of 52,722 acres was tackled for pests and diseases control.

**Coimbatore.**—There was an average rainfall of about 718.2 m.m. The seasonal conditions were mostly normal. The rains in the south-west monsoon facilitated sowing of dry crops and raising of paddy nurseries. Thirteen State Seed Farms were run in the district. Five hundred and seventy-five tons of paddy seeds of improved strains were distributed covering an area of 29,737 acres. One lakh and thirty-one thousand two hundred and fifty-three acres were treated against pests and diseases. One hundred and sixty-four tons of green manure seeds distributed covered an area of 11,716 acres. Forty-six thousand two hundred and eighty-seven acres of paddy crop was grown under Japanese method of cultivation.

**Nilgiris.**—An average rainfall of 2,104.9 m.m. was received during the year. Even though the total rainfall was adequate, want of sufficient and timely showers in the beginning of the main season followed by heavy rains in the growing period affected the yield of potato in Ootacamund taluk.

Special steps are being continued in the district for soil conservation measures under various schemes under the Control of Assistant Agricultural Engineers, Ootacamund and Coonoor. Thirteen State seed farms functioned during the year. Nearly 22 tons of green manure seeds were distributed covering an area of 1,044 acres. Four hundred and four lb. of vegetable seeds were also distributed.

**Tiruchirappalli.**—An average rainfall of 736.4 m.m. was received during the year. While the rainfall and seasonal conditions were mostly normal in the Northern division, there was drought and reduction in yield of crops in the Southern division due to inadequate rains. Seven State Seed Farms functioned during the year. Two thousand one hundred and eighty-three tons of primary and village seed farm seeds of paddy strains were supplied, covering an area of 109,105 acres. Nearly 130 tons of green manure seeds were distributed through department and private sources, which covered an area of 39,016 acres. Seven thousand eight hundred and forty acres were covered under Japanese method of paddy cultivation. One thousand four hundred and thirty-four acres were ploughed with departmental tractors and 586 acres of land were levelled with bull-dozer. A total area of 220,916 acres were handled against pests and diseases.

**Thanjavur.**—Four divisions at Thanjavur, Pattukkottai, Kumbakonam and Mayuram continued to operate each under a District Agricultural Officer. The average rainfall received was 907.6 m.m.

Seasonal conditions were normal except for a period of drought in July-August. There was enough water-supply from the Mettur Reservoir. Twenty-four State Seed Farms functioned during the year. Eight thousand one hundred and ninety-nine tons of paddy seeds of improved strains were distributed. The seed so distributed has covered an area of 383,461 acres. Two thousand three hundred and eleven tons of green manure seeds were distributed through departmental depots and private agencies. The area under green manure crops is 467,990 acres which includes natural spread also. Two hundred and thirty-eight filter points were erected. One river pumping scheme was in operation. Thirteen thousand four hundred and fifty-seven acres were ploughed with departmental tractors and 385 acres were levelled with bull-dozer. Remedial measures were applied in respect of 205,582 acres of crops affected by pests and diseases.

During the year, on 13th April 1960, the Intensive Agricultural District Programme was inaugurated by the Chief Minister. According to the programme, during the year, 20 per cent of the villages in each of the 22 Community Development Blocks will be intensively developed in respect of agricultural production.

**Madurai.**—The seasonal conditions of the year were mostly normal. There was incidence of Red Hairy Caterpillar pest on groundnut and of semilooper and cut worms on cabbages for which control measures were applied as far as possible. Six Seed Farms functioned during the year. Two hundred and one tons of green manure seeds were distributed. Two thousand and eleven tons of paddy seed were distributed to cover 68,663 acres. One lakh and seventy-five thousand seven hundred and fifty-six acres of crops were tackled for controlling pests and diseases. One thousand one hundred and forty-nine acres of land were ploughed with tractors and 290 acres were levelled with bull-dozer.

**Tirunelveli.**—There was an average rainfall of 878.6 m.m. The seasonal conditions were satisfactory. A total area of 68,359 acres was covered to control pests and diseases. One thousand and fifty-one tons of paddy seed were distributed. An area of 47,216 acres was covered. With 67 tons of green manure seeds distributed an area of 100,007 acres was covered under green manure crops. An area of 80,097 acres was planted under Japanese method of paddy cultivation in Tirunelveli division.

**Ramanathapuram.**—An average rainfall of 775.3 m.m. was received. Seasonal conditions were fairly normal in most of the taluks, particularly in the Sattur division. Pest and disease control measures were applied over an area of 86,171 acres. Four hundred and eighty-six tons of paddy seeds of various strains were distributed. This has covered an area of 21,903 acres. One hundred and twenty-seven tons of green manure seeds were supplied covering an area of 15,677 acres. Seven hundred and eighty-five acres of land were ploughed with departmental tractors.

Eighty acres were levelled with bull dozers. The coconut development scheme for cultivation of coconuts in Taravai waste lands was launched this year. Forty-seven landless poor people were already allotted lands at five acres each.

**Kanyakumari.**—Although the average rainfall of 1,508.6 m.m. received during the year was less than that of the previous year, seasonal conditions in general were favourable to the various crops in this district. Twenty thousand four hundred and twenty-three coconut seedlings were distributed from the two nurseries maintained in the district. Two State Seed Farms functioned during the year. About 88 acres of land were ploughed with departmental tractors. Twelve thousand eight hundred and twelve acres of crops were treated for various pests and diseases.

#### XVII. FINANCE.

The following are the expenditure and receipts for the year 1959-60 along with the figures for 1958-59.

| (a) Expenditure.<br>(1)                                                                                        | Total for<br>1958-59.<br>(2) | First half<br>1959-60.<br>(3) | Second half<br>1959-60.<br>(4) | Total for<br>1959-60.<br>(5) |
|----------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|--------------------------------|------------------------------|
| 40. Agriculture ..                                                                                             | 2,02,96,424                  | 70,50,040                     | 1,92,48,150                    | 2,62,98,190                  |
| 71. Capital Outlay, etc.,<br>State Seed Farm.                                                                  | 2,58,282                     | 35,740                        | 38,574                         | 74,314                       |
| 72. Capital account<br>Government Industrial<br>Engineering<br>workshop.                                       | 95,496                       | ..                            | ..                             | ..                           |
| 82. Capital accounts outside<br>the revenue Fillet point scheme<br>etc., account sinking<br>of Artesian wells. | 1,33,492                     | 34,082                        | 2,60,131                       | 3,03,213                     |
| Loans to Cotton growers.                                                                                       | 7,86,211                     | 1,84,723                      | 7,92,270                       | 9,76,993                     |
| Loans to Urban Compost schemes,<br>Panchayat.                                                                  | 38,500                       | ..                            | 2,24,000                       | 2,24,000                     |
| Municipalities ..                                                                                              | 3,88,000                     | 1,15,000                      | 4,30,450                       | 5,45,450                     |
| Loans to City Corporation }<br>Sewage utilisation scheme. }                                                    | 2,00,000                     | 60,000                        | ..                             | 60,000                       |
| Development of Night-<br>soil compost in bigger<br>Panchayats.                                                 | 2,29,000                     | 40,000                        | 6,76,400                       | 7,16,400                     |
| Loans for meeting hire<br>charge on tractors, etc., }                                                          | 480 }                        | ..                            | ..                             | ..                           |
| Horticultural Develop-<br>ment Schemes.                                                                        | 4,350                        | 1,670                         | 1,74,266                       | 1,75,936                     |
| Loans to Market<br>Committees.                                                                                 | 1,71,600                     | 1,00,000                      | 4,000                          | 1,04,000                     |
| Loans for cashew Develop-<br>ment Scheme.                                                                      | ..                           | ..                            | 51,860                         | 51,860                       |
| Loans for Development of<br>Coconut cultivation in<br>Ramanathapuram.                                          | ..                           | ..                            | 2,016                          | 2,016                        |
| Loans for raising grass ..<br>manure crops.                                                                    | ..                           | ..                            | 1,624                          | 1,624                        |
| Loans for soil conserva-<br>tion Scheme.                                                                       | ..                           | ..                            | 13,03,554                      | 13,03,554                    |

| (b) Receipts.             | Total for<br>1958-59.<br>(2) | First half,<br>1959-60.<br>(3) | Second half,<br>1959-60.<br>(4) | Total for<br>1959-60.<br>(5) |
|---------------------------|------------------------------|--------------------------------|---------------------------------|------------------------------|
| XXIX 'a' Agriculture.     | 98,31,180                    | 45,23,461                      | 80,76,765                       | 1,26,20,226                  |
| XXIX 'c' Agriculture.     | 9,93,343                     | 38,929                         | 2,50,186                        | 2,89,115                     |
| XXIX 'd' Agriculture.     | 23,148                       | 8,815                          | 21,011                          | 29,225                       |
| XXIX 'f' Agriculture. (—) | 1,40,931                     | (—) 42,753                     | (—) 1,23,773                    | (—) 1,71,526                 |

#### XVIII. SALIENT FEATURES OF WORK DONE AND OUT- STANDING ACHIEVEMENTS DURING THE YEAR 1959-60.

**Seasons.**—The seasonal conditions of the year were below normal. During the South-West monsoon period, rainfall was deficit in all the districts except Tirunelveli, Nilgiris and Kanyakumari. Sowings of dry crops and raising of paddy nurseries were delayed. Due to the delayed North-East monsoon rains, paddy planting was delayed. The rainfall during this period was deficit in all districts except South Arcot, North Arcot, Salem and Coimbatore. There were incidence of pests on groundnut and paddy. In general, the yields of the crops were affected adversely.

**Second Five-Year Plan.**—The Second Five-Year Plan aimed at a target of additional production of foodgrains by 12.79 lakhs tons by the application of several measures such as improving irrigation facilities, land development and soil conservation measures and by increased use of fertilizers, green manures and compost and improved seeds and by the adoption of Japanese method of paddy cultivation and plant protection measures. As against this, this achievement is estimated to be 8.11 lakhs tons during the first four-year period of the plan. Similarly in respect of oil seeds, against a target of 1.66 lakhs tons, the attainment in the four years is estimated to be 1.20 tons. Under Sugarcane, against a target of 10 lakhs tons, an additional production of 8.31 lakh tons has been achieved during the four years. Under cotton against a target of 1.55 lakhs bales, additional production achieved is estimated to be 0.80 lakh tons of bales.

As regards finance, against the plan provision of Rs. 468.86 lakhs, an amount of Rs. 332 lakhs has been utilized till the end of March 1960.

The achievements so far have not been quite up to the expectations. The reasons for the shortfalls are mainly due to the following factors besides unfavourable seasonal conditions:—

1. Shortage of trained technical personnel.
2. Short supply of Ammonium Sulphate and other Chemical fertilizers.
3. Difficulty in procurement of tractors, spare parts, equipments, etc., due to the revised import policy of the G.O.I. and the foreign exchange position.

**Agricultural education.**—The number of admission to the B.Sc. (Ag.), degree course at the Agricultural College, Coimbatore which was fixed as 162 during 1956-57 was continued as such during this year also. There were 491 students in all the three years, of which 11 were women. As per the latest instructions from the Registrar of Madras University the final year B.Sc. (Ag.), class underwent intensive practical farm training in Agriculture for 1½ months under the extension specialist in collaboration with the Agronomist and Associate professor of Agronomy.

Twenty-three young farmers were given training in improved agriculture for a period of six months. A refresher course for extension officers was conducted. Thirty-seven young men were given practical training in gardening from November 1959 to April 1960.

The post graduate course commenced in 1958 was continued during the year. Thirty-nine candidates were admitted to the course. The training which was originally confined to four faculties was extended two more faculties.

**Brief summary of more important results of research achieved at the Agricultural College and Research Institute, Coimbatore (1959-60).**

**Crop Improvement.**—At the Agricultural College and Research Institute, Coimbatore, Crop improvement was in progress in Paddy, Millets, Pulses, Oil-seeds and Cotton-five major crops of the State. Research in Plant Physiology and Cytogenetics was also conducted. Horticultural Research for the improvement of fruits and vegetables was also done. Besides this, research on Agronomy, Agricultural Meteorology, Chemistry, Plant Pathology, Entomology, Agricultural Engineering and Agricultural Extension was conducted. The brief results of research are submitted below:—

1. **Paddy.**—Rice improvement work was in progress at nine centres in the State. A total of 370 purelines from 26 varieties was isolated and tested for yield. The study of hybrid population with the objective of evolving high yielding strains resistant to blast disease, drought, saline and alkaline conditions and floods was in progress. Two blast resistant cultures 6522 (Co. 13 × Co. 4) and 6538 (GEB. 24 × Co. 4) of short and medium duration respectively have been fixed for release to farmers. Work on evolution of short-term rices possessing seed dormancy, varieties possessing stiff straw and non-lodging habit and high fertility strains is also under progress. The varietal collection at the Paddy Breeding Station, Coimbatore, numbering 2,410 types was maintained genetically pure. Work on mutation breeding has also made some progress and twelve instants induced by treating seed with X-ray; Benzene Vapour, acenaphthene and Ceresan are under district trial. Agronomic investigations during the period indicated that

at Aduthurai Farm yard manure gave the highest yield during Kuruwai season while green manuring was superior in the Thaladi season. Application of ammonium sulphate in split doses had beneficial effects under Coimbatore and Tirurkuppam conditions. The different phosphatic fertilizers did not reveal any difference in their effect on rice yield. The Chinese method of rice cultivation was found to be expensive and not suitable for adoption. Pre-soaking of paddy seeds in sodium Bicarbonate solution resulted in slight increase of yield in rice.

2. **Millets and pulses section.**—In Madras State, millets and pulses occupy an area of 68 lakhs of acres and work on the improvement of these crop is in progress at the Millets Breeding Station, Coimbatore and Agricultural Research Station, Koilpatti.

**Cholam.**—Breeding for the evolution of high yielding grain cum fodder strains in cholam was continued. The quality of Periamanjai cholam was improved by inducing juiciness and one selection A.S. 9079 was found to be superior to Periamanjai cholam in quality of straw, recording 17.4 per cent more grain yield. From the progenies of a cross between cultivated sorghum and Johnson grass, 23 economic selections with heavy tillering and drought resistance characters have been isolated. The striga resistant selection of Periamanjai cholam A.S. 9028 was tried in the districts and its superiority was confirmed. Cholam Co.18 continued to be the best yielder and work on the improvement of the grain is in progress. Work on the production of hybrids in sorghum by the utilization of male sterile lines received from United States of America was taken up.

**Cumbu.**—Work on the production of synthetic varieties was continued. Seeds of 15 inbreds were grown in poly cross nurseries to isolate the best inbreds which will form the parental material for the synthetics. The hybrid seeds of Cumbu × 3 is being multiplied and distributed on a large scale under a scheme entirely financed by the State Government.

**Ragi.**—Ragi strain Co. 7 continued to be popular and registered 43 per cent more yield than the local ragi in Chingleput district. The superiority of the selection E.C. 4723 over the standard strains AKP.1 and AKP.2 were confirmed. Crosses were effected between Co.7 and AKP.2 with the object of evolving high yielding strains maturing in 70 days after planting.

**Tenai and minor millets.**—Two short duration selections of Tenai with heavy tillering habit and drought resistance have been isolated from a cross between strains Co.2 and Co.3. These selections are suitable for raising both under rainfed and irrigated conditions.

**Pulses.**—Work on the evolution of a short duration red gram was continued and selection 2603/2 proved to be early recording 15 per cent more grain yield than the local. A special

scheme for the improvement of field lab-lab has been in progress at the station from July 1959. Crosses have been effected between, field bean and garden bean types. D.L. 1428 a dual purpose lab lab selection was back crossed with parents D.L. 23 field bean type and D.1.250 kitchen garden type to reduce the duration and to tune up the yield of good quality pods. The field lab-lab selection D.L. 2542 has been isolated as the best. This selection can also be grown as a green manure crop as it gives about 29,000 lb. of green matter in about 60 days after sowing.

3. *Oilseeds—Groundnut.*—The spreading selection A.H. 6857 (East Africa) found consistently superior to all the three standards in three years of trial and recording an average increase of 44.3, 32.7 and 28.7 per cent over local strains TMV.1, TMV.2 and TMV.3 respectively was multiplied for district trials. A.H. 6885, one of the 9 selections of the spreading variety registered an average increase of 37.7, 16.4 and 25.6 per cent respectively over the three standard strains.

In the spacing trials with the spreading groundnut, broader spacing of 24" × 3", 18" × 4" and 12" × 6" recorded increased yield of 12.9, 6.9 and 4.4 per cent over the spacing of 9" × 8" (control).

A high yielding and a bold seeded semi-spreading selection A.H. 6719 awaits release as a new strain suitable for dessert purposes under the trade name H.P.

*Gingelly.*—In 1959-60 cold weather season, five selections were compared in yield trial with the local gingelly and the improved strain TMV.2, and four of them gave significantly higher yield, the increase ranging between 11.6 and 32.9 per cent. Two X-ray induced mutants, which were received from the Bose Institute, Calcutta, did not record any appreciable difference in yield when compared to strain TMV. 2. Manurial experiments revealed that gingelly responds well to nitrogenous fertilizers.

*Castor.*—Two short duration selections R.C. 1146 and R.C. 1147 maturing in 5½ months and recording increased yield of 18.4 and 18.8 per cent respectively over TMV.2 were multiplied for district trial.

Three short duration cultures R.C. 1074, 1075 and 1076 and two others, viz., R.C. 1146 and 1147 were issued for trials in 17 centres in the districts.

In hybridization work, cross × 247/TMV.2 × R.C. 820—Russian 13/exhibited superior performance by recording 53.0 per cent higher yield than the strain TMV.1.

The manurial experiments revealed that treatments Np, NPK, NK and N were significantly superior to 'no manure' (control) recording increased yield ranging from 150.3 to 176.8 per cent over the control.

4. *Cotton.*—As a result of cotton research, the character of Madras Cottons has undergone considerable changes to fit in with the needs of the growing textile industry. At the Cotton Breeding Station, screening for a pure and typical perennial cotton Moco was continued. A germ plasm bank of 26 varieties studied for exploring the possibilities of recommending a perennial cotton superior to Moco gave indication of three types, viz., Exotic 3, Dharwar American and American Barbandy, to be better than Moco for general cultivation. This awaits further trials in the districts.

Attempts to explore the possibilities of bringing desirable qualities like resistance to pests, diseases and drought from various wild cottons and introducing them in cultivated cotton varieties were made and on the breeding side, hybrids of resistant wild types proved promising. Derivatives from darwinii × taitense and raimondii with MCU.1 and MCU.2 were superior in length and ginning though equal in yield to control. Among the arboreum × anomalum hybrids, cultures with high degree of fineness and strength were carried forward for further study.

Genetical investigations on the different lintless mutants showed independent assortment of lint quantity genes with leaf lobes, petal colour, and anthocyanin pigmentation.

A few of the crosses studied under heterosis did not show any manifestation of hybrid vigour and fresh crosses involving MCU.3 (Pongal) as the maternal parent were effected for further exploitation.

The cytological studies indicated that the chromosome behaviour in the sterile hybrids revealed associations ranging from univalents to hexavalents resulting in unbalanced and unviable gametes causing sterility.

Another line of work attempted was to cross two groups of cottons which differ fundamentally in chromosome numbers. Observations made on the plants suspected to be triploids of Asiatic American origin proved to be maternal. Mass hybridization was done on the above lines for further study. Setting was rare and a few bolls were obtained which are to be tested for hybridity.

The work of the winter Cambodia scheme resulted in the evolution of a new strain MCU.3 (Pongal) possessing a mean fibre length of 1-1/16" and more resistant to jassid and pemphigus with better yield and spinning performance. More unique was the character of MCU.3 (Pongal) being adaptable for unirrigated winter tracts as well and found suitable to replace MCU.1 until further work resulted in the evolution of a better strain.

In the breeding of extra long staple cotton at Srivilliputhur promising cultures like 0892-B, LO 313 W and E 192 which recorded superior length (more than 1.02") combined with better

yield, fineness and strength have been studied in Main strain trial and further observations are being carried out. Numerous progenies in the lower stages of breeding are noteworthy for their superior length even exceeding to the objective of the scheme (1-3/16").

The breeding of Karunganni and Tinnevelles cotton was in progress and two new cultures 9978-B-5 and 9705-C were found to be on par with the standard (K.6 Pandyan) in production. Culture 9833-4 excelled the standard in yield, length and ginning.

In the breeding trials for improvement of unirrigated Cambodia, MCU.3 (Pongal) was found to be superior and adaptable to rainfed conditions also. Strains PK 860, PK 863 and PK 1053, studied in the Main Strain Trial excelled the targets fixed for yield while combining superior fibre properties. The Scheme was wound up on 14th September 1960.

5. *Botany*.—Seeds of *abelmoschus esculentus* (Bhendai) and *Trichosanthes anguina* (Snake gourd) showed the absence of dormancy. Types A.C. 1883 and 878 of *Coriandrum sativum* were promising under Coimbatore conditions.

A case of abnormal meiosis in *Sorghum helepense* and another accessory chromosomes in *Sorghum nitidum* were studied in detail. Chromosome numbers of 24 species of grasses were determined, out of which four were new records.

Foliar applications with macro-nutrients on G.E.B.24, suggested the positive increase in height of the plants, as well as straw yield but there was no corresponding grain yield.

On herbicide trials 2, 2-Dichloro-propionic acid successfully controlled nut grass (*Cyperus rotundus*) and Hariyali (*Cynodon dactylon*) at 10 to 15 lb. per acre, acid equivalent.

6. *Horticulture—Fruits*.—The introduced grape variety Anab-E-Shahi continued to maintain its superior yield performance recording a total of 644 bunches in the two crops in the seventh year of planting. The yield of bunches in this variety was found to be the maximum near the periphery of the arbour on canes 8 to 10 mm. diameter and on the 4th and 5th mode. Pandal system of training was found to be the most optimum for this variety. Favourable indications on the possibility of extending cropping in grapes for almost throughout the year were revealed in the monthly pruning trial with the Bangalore Blue variety. A promising inbred strain of Washington papaya has been purified to an appreciable extent for release as Co.2 in due course. Certain hermaphrodite forms of papaya of promise were located. Tipping the past season's leaders in guava appeared to be desirable for enhancing flowering and fruit-set. In Sapota, the possibility of enhancing fruit-set by inter-varietal pollination was

indicated. Laboratory tests to germinate the pollen of sapota were developed. Four types of tomato, three in brinjal and two in bhendi showed promise as high yielders. The superiority of five exotic sweet potato varieties, viz., V2, V6, V8, V12 and B.219 over the local was established. Planting sweet potato early in October and providing 12 irrigations were found to be conducive for maximum yield of tubers.

7. *Agronomy*.—In the rotation trials in garden cropping of Coimbatore district, intensive rotation was found to yield higher monetary value than the less intensive rotation in the Third Cycle of rotation.

In the Wetland rice, 60 lb. of N, P and K20 were found optimum while different types of tillage did not produce differential results.

In phosphate trials, different methods of application did not differ significantly in their effect on the yield of paddy.

In the scheme on the uptake of phosphate by legumes, no difference in yields of green manure or paddy subsequently grown was noticed at Coimbatore while in Aduthurai, Kolinji (wild Indigo) was found better than sunhemp or pillipesara.

The chemical investigations on the cause of paddy blast showed that neither forms of Nitrogen nor levels and combination of N and K had any significant effect in the incidence of blast.

In the soil investigations at Bhavanisagar cultivation of legumes with phosphates and application of Farm Yard Manure increase the water holding capacity of these soils. The best rotation for Lower Bhavani Project area is found to be groundnut, cotton and sunhemp.

Seven thousand five hundred and ninety lb. of Sunhemp compost was found best for the poor soils of Bhavanisagar. Similarly sunhemp grown for green manure with Phosphates applied increased the yields of Millets and cotton crops. In the mixed cropping trials cotton, groundnut mixture was found to be the best.

The Pilot scheme of Agronomic Research was initiated in the Black soil areas of Tirunelveli district and eight sites have been selected.

8. *Agricultural Meteorology*.—(1) The study of the influence of weather on the growth and yield of crops indicated that paddy Co. 25 crop requires wet weather during the second and third weeks before flowering for giving good yield in spite of the fact that it is grown purely under wet conditions. Every inch of rainfall during this period tends to increase the grain yield by 86 lb. per acre and every rainy day increases the yield by 119 lb. per acre. This is an important factor which can be taken into account for forecasting the yields of paddy Co.25 at Coimbatore with fair degree of success.



(2) From the statistical analysis of the available past data it was found that the yield of gingelly TMV.3 was adversely affected by long flowering duration. For every day increase in the duration of flowering phase the acre yield of gingelly TMV.3 tends to decrease by 19.61 lb.

(3) The yield of cold-weather crop of TMV.2 gingelly has a positive association with the cumulative mean diurnal temperature during the first fortnight after sowing. The yield increases by 1.38 lb. per acre for every degree increase of temperature during this period. The results require confirmation by conducting systematic studies on the above crops.

(4) The experiments done at Coimbatore in regard to artificial stimulation of clouds indicate that it is possible to improve the pattern of rainfall in the leeward direction to the extent of 15 to 20 miles by sending up fumes of calcium chloride and sodium chloride (4:1) through a ground chimney.

9. *Soil Science Section.*—(1) Fundamental research work on soils to study the effect of cations and anions exchange, has revealed that calcium soils from black soils have a higher base exchange capacity, higher water holding capacity and improved structure. In the case of alluvial soils (Aduthurai and Kulitalai) the volume expansion, PH, moisture equivalent and dispersion co-efficient are lower when converted into calcium soils. Calcium soils derived from laterite soils of Nanjanad and Pattambi showed higher water holding capacity, dispersion Co-efficient and moisture equivalent than the original soils.

(2) *Soil Surveys and Land Reclamation studies.*—Amaravathy Project area soil survey has indicated that the soils can be divided into two major classes, i.e. (1) a moderately drained latosols at the elevated areas and (2) alkali soil of varying gradation with impeded drainage at the low lying areas and valleys. For good response to irrigation in the area general improvement of the drainage system is essential.

In the permanent manurial experiments conducted it has been seen that cattle manure plots were the best followed by NPK and NP plots. Experiments were conducted with cholam in the O.P.M. PLOTS and with cumbu in the N.P.M. plots.

Rapid soils tests conducted in the Soil Testing service Laboratory where nearly 2,500 samples were analysed and recommendations made, have shown that the soils of Madras State are generally deficient in nitrogen and phosphorous while potash is present in adequate quantities.

Studies on the reversion of phosphates in the laterite soils of Nilgiris reveal that liming at 7,500 lb. per acre is definitely beneficial, dicalcium phosphate is superior to rock phosphate and bone-meal, super phosphate is superior to bone-meal but on a par with dicalcium phosphate and rock phosphate.

For reclamation of alkaline soils in Ramanathapuram, Madurai and Tinnevely districts, application of six tons of gypsum and 5,000 lb. of green leaf per acre have been found to be effective, but only in the initial stages. The effect of gypsum application is lost in the course of two years. Digging of drainage channels and bunding of the fields are quite effective.

(3) *General.*—Storage studies on different varieties of groundnut kernels and cakes reveal that coromandel variety has poor storage properties compared to the Red Natal and peanut. Gunnies and polythene lined bags are very suitable, for stringing the kernels. Use of binding materials like jaggery, water, gum, etc. for groundnut cakes is not advisable. Plain gunnies and polythene lined bags are suitable for storage of cakes also.

Studies on the use of iron chelates in the nutrition of paddy reveal that iron chelate applied with green leaf gives higher yield both in grain and straw.

Application of nutrients as foliar spray has been found to be effective. Spraying of peptonised groundnut cake for potato has revealed this; part of the nitrogen given in the form of spray has resulted in higher yield of potatoes compared to the usual Nanjanad mixture.

Studies on the influence of manuring on the nutritional quality of both Ragi and Tenai reveal that the total and non-phytin phosphorus of the grains increase on the addition of phosphorus as fertilizer to the soil. Cereal grains from NP and NPK treatments were found to contain higher phosphorus—both total and non-phytin than those from cattle manure treatments.

10. *Entomology Section.*—Experiments conducted to fix up a schedule of treatments against pests of cotton and paddy indicated the efficacy of Endrin 0.02 per cent and Parathion (Folidol) 0.025 per cent spray respectively in controlling all the pests affecting the two crops and increasing the yield. The same two chemicals were found effective in reducing the incidence of the cholam stem borer, *Chilo zonellus* S. Malathion and BHC sprays applied thrice at Monthly intervals from the flowering time gave some indicative results in the control of the castor shoot and pod borer—*Dichrocrocis punctivalis*. G. Insecticidal trials against *Bruchus theobromæ* F. on redgram in the field indicated the superiority of Toxaphene 10 per cent dust in reducing the infestation and increasing the yield. Work was also in progress on paddy stem borer, sugarcane borers, toxicology of systematic insecticides in the control of tissue borers and coccids, vegetable pests and bee-keeping under the auspices of several schemes financed by the Indian Council of Agricultural Research and other Commodity committees.



Endrin and Parathion sprays applied thrice at different stages of crop growth gave good control of the paddy stem borer-Schönobius incertulas, Wlk. Endrin 0.02 per cent spray applied thrice at fortnightly intervals was found effective against the bhendai shoot and fruit borer Earias spp. Experiments conducted against the brinjal fruit borer Leucinodes orbonalis, G. indicated the efficacy of Lindane 0.1 per cent spray in controlling the pest. Dieldrin 0.1 per cent and Endrin 0.02 per cent sprayed thrice at fortnightly intervals gave significant control of the tomato fruit borer Prodenia litura F.

Endrin 0.1 per cent and Gammexane E.C. with Lissopal gave good reduction in the incidence of the early shoot borer Chilo-traea infuscatella, S. and the top borer Scirpophaga nivella, S. of sugarcane respectively.

The results of research were transmitted to the Plant Protection Organization for adoption.

11. *Mycology Section*.—Spraying rice crop with Bordeaux mixture and other copper fungicides against blast disease was found to give increased grain yields up to 30 per cent. Drenching the soil with wet ceresan thrice during crop growth was found to be useful in keeping stem rot disease under effective control. Spraying cotton crop with Antibiotics Streptomycin and Agrimycin and the fungicide Bordeaux mixture against black arm disease was found to give increased yields ranging from 12-17.5 per cent. One culture, viz., 2196 exhibited considerable resistance to black arm disease under field conditions. Flooding the fields infested with banana wilt pathogen for a period of six months appears to be effective in killing the fungus in the soil. Application of fungicides, viz., Bordeaux mixture and Dithane Z. 78 to the soil in the control of betel vine wilt gave higher leaf yield. The control of virus disease of vegetables by the application of insecticides resulted in the reduced disease incidence and higher yields. Among the various fungicides tested for the control of 'damping off' of tomato, Dithane Z. 78 was found to be the best followed by Bordeaux mixture and Cupravit. Seed treatment with Cerenox was found effective in controlling 'damping off' of bhendi. Studies on the effect of application of weedicides to the soil on the soil microflora revealed that 2, 4-D at 10 lb. per acre was toxic to bacteria while there was no significant change, in the soil microflora by the application of Extar 'A'.

12. *Agricultural Engineering Section*.—(1) Initial trials with an oscillating type of spray irrigation unit (Kennel's oscillator) proved that unequal dispersion of the spray was caused even by normal wind velocities.

(2) A small draft plough for single bullock power useful for work on the hill slopes was manufactured. Trial reports from Nanjanad are awaited on this.

(3) Based on the principle of the fluid flow through a standard plug of cotton, a fineness testing device for cotton was designed and fabricated. Initial trials are encouraging. When completed with refinements, this may become a cheap and useful equipment for laboratory work.

(4) Poultry trap nests with quadrant pieces to serve as closing doors were developed and supplied to the dairy for trials.

(5) Six improved planting lifters for use in orchards were made and sent to the State Farms for trials.

(6) Useful equipments for soil conservation work were under different stages of development during the year. A cheap wooden level with refinements for viewing at the eye level was designed. It is awaiting further trials at the field.

(7) Considerable improvements in the shape of properly designed mallets were added to the original bark remover unit developed at the instance of the Director of Cinchona Plantations at Anamalai. Increased output has been recorded with saving in time. A double acting power operated bark remover showed further promise of efficiency. This is under trials now.

(8) The addition of support wheels and tyre points served to improve the original 'Kenya' an earth scoop. Reversibility was introduced so as to utilize the same unit as a cultivator as well. The Assistant Agricultural Engineer (Soil Conservation) is making trials with this.

(9) Two paddy transplanter units were acquired from Messrs. Krishi Sadhan Khendra, Surat. These are being experimented upon.

(10) A small paddy sheller for ordinary domestic use was designed. This has two truncated cones, one rotating within the other. Small quantities of paddy, when passed between the interspace between the revolving cones, get shelled.

13. *The Extension Section*.—The Extension Section at the Agricultural College and Research Institute, Coimbatore, was established as outlined in G.O. Ms. 2136, Food and Agriculture, dated 28th May 1959, on 3rd August 1959 :—

(1) Extension classes for final year B.Sc. (Ag.) students were conducted.

(2) The section kept in touch with research programmes and invited problems of farmers through Block Development Officers for initiative research.

(3) The section has initiated surveys in respect of (a) spread of millet seeds, (b) publicity of improved paddy seeds distributed by the Department and (c) spread of improved ploughs.

Japanese method of paddy cultivation is to be intensively surveyed and the questionnaire was prepared and sent for printing.

(4) The section was in charge of the inservice training of the Extension Officers. Five refresher courses were conducted for Extension Officers, each of one month duration. One hundred and sixty-five Extension Officers were trained. (Eighty-six from Madras State and 79 from Mysore State.)

(5) The section co-ordinated the efforts of different Research sections for the World Agricultural Fair, New Delhi, Teynampet Exhibition at Madras, and the Annual Swadeshi Arts Exhibition at Coimbatore.

#### SUGARCANE.

At the Central Sugarcane Research Station, 32 Coimbatore varieties and 11 foreign varieties were under multiplication. In the varietal trials of early varieties no variety proved superior to the standards. In the trials of late varieties Co. 1176 recorded the maximum yield of 54.8 tons per acre. In the manurial trials, inorganic fertilizers like urea, ammonium sulphate, nitrate and calcium ammonium nitrate proved to be as good as ammonium sulphate. In the response of sugarcane to phosphate trial there was not much difference in yield. In the propping and thrashing trial 'no propping and no thrashing' gave the maximum yield.

At Gudiyatham 32 new Coimbatore cane varieties were received and multiplied for taking over to the varietal study plots. Out of 71 varieties under trial in the varietal study plots, seven varieties suitable for early season and eight for late season were selected and promoted to the preliminary yield trial stage. In the preliminary trials, Co. 1205 recorded the maximum yield. In the main yield trial of early varieties Co. 658 recorded the maximum yield of 45.03 tons and in the late varieties Co. 44 recorded a good yield although the difference was not significant.

At Kulitalai, in the main yield trials, Co. 1001, gave the maximum yield of 35.27 tons against the yield of 24.31 tons given by Co. 419. Forty new Coimbatore varieties were studied under single series observation plots. Due to poor germination and due to floods in the growing period, yields were poor.

A total quantity of 61.15 tons of planting material was distributed from the sugarcane station during the year.

**Agricultural Extension.**—The Agricultural Extension Staff intensified their propaganda and demonstration for increased production under Grow More Food and other schemes like Cotton Extension, Sugarcane and Oilseeds Development. Special emphasis was laid on the Japanese method of paddy cultivation, sinking of filter points and tube wells, application of composts, green manures and fertilizers. A continuous flow of improved seeds of paddy was maintained by multiplication of nucleus seeds of improved strains in State Seed Farms and Primary Seed Farms and further multiplication and distribution from village seed farms.

The following were the achievements during the year :—

|                                  | Quantity distributed. |                  | Additional production in tons. |
|----------------------------------|-----------------------|------------------|--------------------------------|
|                                  | Tons.                 | Lb.              |                                |
| <b>Paddy—</b>                    |                       |                  |                                |
| Nucleus .. .. .                  | 111                   | 755              | 1,26,958                       |
| Primary .. .. .                  | 2,317                 | 551              |                                |
| Village seed farms ..            | 25,784                | 815              |                                |
| <b>Millets—</b>                  |                       |                  |                                |
| Nucleus .. .. .                  | 78                    | 2,231            | 24,012                         |
| Primary .. .. .                  | 228                   | 1,056            |                                |
| Village seed farm ..             | 2,527                 | 1,647            |                                |
| <b>Pulses—</b>                   |                       |                  |                                |
| Nucleus .. .. .                  | 2                     | 2,330            | 15                             |
| Cotton .. .. .                   | ..                    | 43,064 Mds.      | 79,726 bales.                  |
| <b>Sugarcane—</b>                |                       |                  |                                |
| <b>Oilseeds—</b>                 |                       |                  |                                |
| Primary and secondary seeds ..   | 5,243 Mds.            | 1.2 lakh Mds.    |                                |
| Zonal nucleus seed farm seeds .. | 83,173 lb.            | ..               |                                |
| Green manures .. ..              | 1,528 tons.           | 2.96 lakhs tons. |                                |
| <b>Compost—</b>                  |                       |                  |                                |
| Urban .. .. .                    | ..                    | 313,260 tons.    |                                |
| <b>Fertilizers—</b>              |                       |                  |                                |

| Name of fertilizers.              | Quantity distributed from April 1959 to March 1960. |
|-----------------------------------|-----------------------------------------------------|
|                                   | TONS.                                               |
| Ammonium sulphate .. .. .         | 83,301                                              |
| Urea .. .. .                      | 21,198                                              |
| Ammonium sulphate nitrate .. .. . | 9,185                                               |

**Plant protection measures.**—An area of 466,303 acres and 57,047 trees were treated against diseases during the year resulting in saving of 9,635 tons of food crops and Rs. 21,12,874 worth of other crops.

An area of 14,87,334 acres of food crops and others and 94,324 numbers of trees and plants were treated against pests during the year resulting in a saving of 28,551 tons of food crops.

**Agricultural marketing.**—In order to promote grading of agricultural produce, the post of one Assistant Marketing Officer and eight Marketing Assistants were sanctioned during the year. Three laboratories for grading ghee and oil were run by Government in Coimbatore, Karur and Dharapuram. Sixteen thousand one hundred and sixty-seven maunds of ghee was graded and packed under 'Agmark' during the year. Four thousand, three hundred and two maunds of gingelly oil, 3,150 maunds of groundnut oil, 55,000 maunds of rice, 3,862 maunds of potatoes, 2,857,427 eggs and 16,181 fruits were other commodities graded by the various authorized packers of the State during this year.

The Madras Commercial Crops Markets Act, 1933, was in force in the districts of Coimbatore, South Arcot, North Arcot, Tiruchirappalli, Ramanathapuram and Tirunelveli. There were

twenty-six regulated markets in these districts. Out of these the markets at Polur and Wandiwash in North Arcot district and Ariyalur in Tiruchirappalli district were opened during the year under report.

Enquiries on market information from traders, co-operative societies and members of the trade were attended to as usual. Weekly, fortnightly and monthly reports of prices of important agricultural commodities in important assembling markets were collected, and maintained and this information was also furnished to other departments. Wherever required, help was rendered to Co-operative Marketing Societies. Seven new warehouses were opened by the State Warehousing Co-operation during the year, bringing the total number of warehouses to 11 in all.

The Agricultural Produce Markets Bill was passed by both the houses of Legislature. The rules under the Act are under scrutiny by Government.

**Crop sampling surveys.**—On paddy and millet crops for estimating the average yield and production of the crops were continued during the year. The average acre yield of rice for the State as a whole in respect of I, II and III crop of paddy worked out respectively to 1,402 kg., 1,524 kg. and 1,224 kg. per hectare and the total production of rice during the year is estimated to be 33,05,200 tons.

The additional yields due to Grow More Food Aids as assessed during the year are given below :—

|                           | Estimated<br>additional<br>yield/kg<br>hect. |
|---------------------------|----------------------------------------------|
| Improved seeds .. .. .    | 313                                          |
| Green manure .. .. .      | 299                                          |
| Ammonium sulphate .. .. . | 397                                          |

**Crop competition.**—Crop competitions were conducted on the following crops: Paddy, cholam, cumbu, groundnut, sugarcane and potato. The numbers of competitors enlisted and the highest yield obtained are given below :—

| Crops.            | Number<br>of<br>competitors. | 1958-59—Highest<br>yield obtained<br>per acre/lb. |
|-------------------|------------------------------|---------------------------------------------------|
| (1)               | (2)                          | (3)                                               |
| Paddy .. .. .     | 10,482                       | 8,300                                             |
| Cumbu .. .. .     | 248                          | (Not yet finalized)                               |
| Cholam .. .. .    | 508                          | 6,040 lb.                                         |
| Potato .. .. .    | 158                          | 14,800 ..                                         |
| Sugarcane .. .. . | 530                          | 145 tons and<br>222 lb.                           |
| Groundnut .. .. . | 1,712                        | 4,980 lb. per acre.                               |

**Agricultural Engineering—Tractor hiring scheme.**—This scheme is of utmost benefit to the ryots in providing them with tractors and bulldozers at reasonable hire charges for reclamation of their lands. The department is in possession of 73 bull-dozers and 60 tractors. A total area of 5,435 acres of virgin lands and 9,286 acres of current fallows were ploughed during the period under report. About 12 units are working in various centres of Soil Conservation Schemes in Nilgiris and other districts.

**Tractor Hire-purchase Scheme.**—Five tractors were purchased at a cost of Rs. 80,686.60 and distributed to the parties under the scheme during April, May and June 1960.

**Scheme for hiring of Oil Engines.**—Out of a target of hiring 290 units to irrigate a minimum of 2,320 acres during 1959-60, the achievement was 290 units hired to irrigate 10,525 acres.

**Scheme for the purchase and distribution of Oil Engines and Electric Motors under Hire-purchase System.**—During 1959-60 Government sanctioned the scheme for the supply of 175 oil engines and 475 electric motors at an estimated cost of Rs. 10 lakhs. During the period under report 120 oil engines and 426 electric motors were purchased and distributed at a cost of Rs. 9,54,975-09 nP.

**Filter Point Tube-wells Scheme and Pumping and Boring Scheme.**—During the period under report 687 wells have been sunk and 123,408 feet 3 inches have been bored.

**Soil Conservation.**—Special soil conservation measures were undertaken in various parts of the State for protecting the valuable top soil from erosion and also for conservation of soil moisture for production of better crops. The great importance of these measures particularly to Nilgiris district were recognized.

The following were the achievements under the different schemes during the year :—

|                                                                                                                  | Acres<br>covered. |
|------------------------------------------------------------------------------------------------------------------|-------------------|
| 1 Special Comprehensive Soil Conservation Scheme in 5,000 acres in Nilgiris district.                            | 5,516             |
| 2 Scheme to tackle 1,500 acres in Nilgiris district in April to June 1960.                                       | 152               |
| 3 Soil Conservation Scheme in Kadambuliur firka.                                                                 | 6,484<br>+ 733    |
| 4 Tiruvellore Soil Conservation Scheme ..                                                                        | 1,885             |
| 5 Dry Farming Scheme, Coimbatore district.                                                                       | 88                |
| 6 Soil Conservation measures in 2,000 acres in Marappanaickenpatty and Kondireddipatty villages of Ma'hur firka— |                   |
| (1) Bunding .. .. .                                                                                              | 2,255 acres.      |
| (2) Consent Statements obtained ..                                                                               | 4,871 ..          |
| (3) Area surveyed .. .. .                                                                                        | 1,255 ..          |

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5 Soil Conservation measures in 2,000 acres in Marappanaickenpatty and Kondiredipatti villages of Mathur firka—cont.

|                                                 |         |
|-------------------------------------------------|---------|
| (4) Gully plugging .. .. .                      | 21 Nos. |
| (5) Estimates prepared .. .. .                  | 1,968   |
| (6) Level and contour lines fixed for estimate. | 918     |

7 Soil Conservation Scheme in the Nilgiris district (Coonoor Division)—

|                           |            |
|---------------------------|------------|
| By the department—        |            |
| Bench Terracing .. .. .   | 373 acres. |
| Contour Trenching .. .. . | 115 "      |
| Area surveyed .. .. .     | 265 "      |
| By the Ryots—             |            |
| Bench Terracing .. .. .   | 6 "        |
| Contour Trenching .. .. . | 45 "       |

8 Pallalakuppam scheme work done—

|                                       |              |
|---------------------------------------|--------------|
| 1 Contour bunding .. .. .             | 1,130.55 "   |
| 2 Contour trenching .. .. .           | 7.38 "       |
| 3 Chain survey .. .. .                | 346.80 "     |
| 4 Gully plugging .. .. .              | 40 Nos.      |
| 5 Waste weirs .. .. .                 | 1 No.        |
| 6 Checkdams .. .. .                   | 8 Nos.       |
| 7 Diversion drain .. .. .             | 7,969 R. ft. |
| 8 Levelling by bull-dozer .. .. .     | 31-63 "      |
| 9 Path Road formation .. .. .         | 5,688 R. ft. |
| 10 Area surveyed for estimate .. .. . | 674-84 "     |

9 North Arcot district scheme—

|                         |              |
|-------------------------|--------------|
| Contour bunding .. .. . | 1,929 acres. |
| Levelling .. .. .       | 5 "          |

10 Perumalkuppam scheme—

|                                       |           |
|---------------------------------------|-----------|
| Contour bunding .. .. .               | 811 "     |
| 11 Marappanaickenpatti scheme .. .. . | 1,076 "   |
| 12 Salem district scheme .. .. .      | 305 "     |
| 13 Samayapuram scheme .. .. .         | 2,616 "   |
| 14 Sakkanam scheme .. .. .            | 1,260 "   |
| 15 Adhanakottai scheme .. .. .        | 3,713 "   |
| 16 Athur scheme .. .. .               | 2,482 "   |
| 17 Batlagundu scheme .. .. .          | 1,061 "   |
| 18 Kodaikanal scheme .. .. .          | 206 "     |
| 19 Bodinaikanur scheme .. .. .        | 4½ Miles. |

V. KARTHIKEYAN,  
Director of Agriculture.

## AGRICULTURAL DEPARTMENT

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| District.       | South-west monsoon. (June to September 1959). |         |            |         |              |         |                 |         |         |         |         |        | Percentage departure from the normal. |
|-----------------|-----------------------------------------------|---------|------------|---------|--------------|---------|-----------------|---------|---------|---------|---------|--------|---------------------------------------|
|                 | June 1959.                                    |         | July 1959. |         | August 1959. |         | September 1959. |         | Total.  |         |         |        |                                       |
|                 | Normal.                                       | Actual. | Normal.    | Actual. | Normal.      | Actual. | Normal.         | Actual. | Normal. | Actual. |         |        |                                       |
| (1)             | (2)                                           | (3)     | (4)        | (5)     | (6)          | (7)     | (8)             | (9)     | (10)    | (11)    | (12)    |        |                                       |
| Madras          | ..                                            | 48.3    | 51.1       | 91.4    | 68.1         | 116.8   | 27.5            | 119.4   | 84.9    | 375.9   | 229.6   | - 38.9 |                                       |
| Chingleput      | ..                                            | 49.8    | 55.3       | 89.0    | 82.3         | 126.1   | 66.9            | 131.7   | 88.8    | 398.6   | 293.3   | - 26.0 |                                       |
| South Arcot     | ..                                            | 45.4    | 20.9       | 72.7    | 10.7         | 136.1   | 70.1            | 143.7   | 98.0    | 397.9   | 199.7   | - 49.8 |                                       |
| North Arcot     | ..                                            | 61.8    | 43.6       | 86.9    | 26.9         | 133.2   | 68.2            | 167.2   | 124.2   | 447.1   | 262.9   | - 41.2 |                                       |
| Salem           | ..                                            | 54.5    | 89.9       | 62.5    | 25.6         | 109.2   | 83.2            | 133.5   | 135.1   | 359.7   | 333.8   | - 7.2  |                                       |
| Coimbatore      | ..                                            | 34.8    | 77.0       | 37.2    | 52.0         | 63.1    | 38.0            | 74.4    | 72.5    | 199.5   | 239.5   | + 20.1 |                                       |
| Tiruchirappalli | ..                                            | 41.5    | 60.7       | 47.1    | 14.9         | 101.0   | 55.9            | 125.7   | 101.6   | 315.3   | 233.1   | - 26.1 |                                       |
| Thanjavur       | ..                                            | 36.3    | 52.9       | 47.5    | 7.8          | 97.5    | 48.4            | 107.4   | 63.7    | 288.7   | 172.8   | - 40.1 |                                       |
| Madurai         | ..                                            | 33.7    | 58.3       | 34.2    | 10.8         | 69.8    | 44.2            | 83.7    | 95.6    | 226.4   | 208.9   | - 7.7  |                                       |
| Ramanathapuram  | ..                                            | 23.3    | 53.5       | 31.1    | 9.1          | 61.0    | 35.9            | 70.7    | 41.6    | 186.1   | 140.1   | - 24.7 |                                       |
| Tirunelveli     | ..                                            | 30.0    | 47.8       | 26.7    | 40.4         | 23.0    | 22.0            | 30.6    | 29.3    | 110.3   | 139.5   | + 26.5 |                                       |
| The Nilgiris    | ..                                            | 239.7   | 338.5      | 368.9   | 494.0        | 269.8   | 187.0           | 181.0   | 207.5   | 1,059.4 | 1,227.0 | + 15.8 |                                       |
| Kanyakumari     | ..                                            | 209.5   | 213.9      | 121.1   | 334.1        | 68.8    | 68.4            | 84.5    | 105.0   | 483.9   | 721.4   | + 49.1 |                                       |

## APPENDIX I—cont.

## Rainfall Statement, 1959-60—cont.

North-east monsoon (October to December 1959).

| Districts.         | North-east monsoon (October to December 1959). |         |                |         |                |         | Percentage departure from the normal. |        |        |
|--------------------|------------------------------------------------|---------|----------------|---------|----------------|---------|---------------------------------------|--------|--------|
|                    | October 1959.                                  |         | November 1959. |         | December 1959. |         |                                       | Total. |        |
|                    | Normal.                                        | Actual. | Normal.        | Actual. | Normal.        | Actual. |                                       |        |        |
| (1)                | (2)                                            | (3)     | (4)            | (5)     | (6)            | (7)     | (8)                                   | (9)    | (10)   |
| Madras ..          | 302.3                                          | 343.1   | 363.2          | 304.4   | 147.3          | 36.0    | 812.8                                 | 683.5  | - 15.9 |
| Chingleput ..      | 261.2                                          | 242.0   | 309.8          | 303.3   | 117.9          | 26.0    | 688.9                                 | 571.3  | - 17.1 |
| South Arcot ..     | 226.8                                          | 187.8   | 277.0          | 343.0   | 136.7          | 128.7   | 640.5                                 | 659.5  | + 3.0  |
| North Arcot ..     | 165.5                                          | 188.1   | 162.2          | 183.7   | 58.8           | 21.8    | 386.5                                 | 393.6  | + 1.8  |
| Salem ..           | 154.3                                          | 198.7   | 103.4          | 153.0   | 30.4           | 32.1    | 288.1                                 | 383.8  | + 33.2 |
| Coimbatore ..      | 166.3                                          | 183.0   | 112.7          | 120.6   | 35.5           | 43.3    | 314.5                                 | 346.9  | + 10.3 |
| Tiruchirappalli .. | 169.7                                          | 162.5   | 151.2          | 166.1   | 74.1           | 43.8    | 395.0                                 | 372.4  | - 5.7  |
| Thanjavur ..       | 207.0                                          | 234.5   | 295.2          | 274.0   | 175.5          | 98.9    | 677.7                                 | 607.4  | - 10.4 |
| Madurai ..         | 185.3                                          | 136.4   | 155.9          | 182.3   | 57.4           | 53.5    | 398.6                                 | 372.2  | - 6.6  |
| Ramanathapuram ..  | 180.4                                          | 192.9   | 180.9          | 181.8   | 87.5           | 45.6    | 448.8                                 | 420.3  | - 6.4  |
| Tirunelveli ..     | 170.8                                          | 154.7   | 205.1          | 156.4   | 111.5          | 67.3    | 487.4                                 | 378.4  | - 22.4 |
| The Nilgiris ..    | 253.3                                          | 283.9   | 175.9          | 163.7   | 66.8           | 44.3    | 496.0                                 | 491.9  | - 0.8  |
| Kanyakumari ..     | 241.8                                          | 124.6   | 216.2          | 135.1   | 62.1           | 28.6    | 520.1                                 | 288.3  | - 44.6 |

Winter period (January to February 1960).

| Districts.         | Winter period (January to February 1960). |         |                |         |         |         |        | Percentage departure from the normal. |
|--------------------|-------------------------------------------|---------|----------------|---------|---------|---------|--------|---------------------------------------|
|                    | January 1960.                             |         | February 1960. |         | Total.  |         |        |                                       |
|                    | Normal.                                   | Actual. | Normal.        | Actual. | Normal. | Actual. |        |                                       |
| (1)                | (2)                                       | (3)     | (4)            | (5)     | (6)     | (7)     | (8)    |                                       |
| Madras ..          | 35.6                                      | 43.1    | 7.6            | ..      | 43.2    | 43.1    | - 0.2  |                                       |
| Chingleput ..      | 32.3                                      | 30.8    | 11.8           | ..      | 44.1    | 30.8    | - 30.2 |                                       |
| South Arcot ..     | 43.0                                      | 11.9    | 13.9           | 0.2     | 56.9    | 12.1    | - 78.7 |                                       |
| North Arcot ..     | 23.2                                      | 3.0     | 8.7            | ..      | 31.9    | 3.0     | - 90.6 |                                       |
| Salem ..           | 11.3                                      | 0.3     | 7.4            | ..      | 18.7    | 0.3     | - 98.4 |                                       |
| Coimbatore ..      | 13.7                                      | ..      | 10.6           | 2.0     | 24.3    | 2.0     | - 91.8 |                                       |
| Tiruchirappalli .. | 30.0                                      | 0.1     | 11.5           | 12.1    | 41.5    | 12.2    | - 70.6 |                                       |
| Thanjavur ..       | 55.0                                      | 21.2    | 17.0           | 31.5    | 72.0    | 52.7    | - 26.8 |                                       |
| Madurai ..         | 24.0                                      | 0.2     | 15.2           | 0.9     | 39.2    | 1.1     | - 97.2 |                                       |
| Ramanathapuram ..  | 37.3                                      | 0.5     | 19.3           | 25.2    | 58.6    | 25.7    | - 54.6 |                                       |
| Tirunelveli ..     | 47.1                                      | 5.8     | 30.7           | 46.9    | 77.8    | 52.7    | - 32.3 |                                       |
| The Nilgiris ..    | 31.9                                      | 5.8     | 25.3           | 0.1     | 57.2    | 5.9     | - 89.7 |                                       |
| Kanyakumari ..     | 24.4                                      | 7.1     | 20.4           | 12.9    | 44.8    | 20.0    | - 55.4 |                                       |

## APPENDIX No. I—cont.

## Rainfall Statement 1959-60—cont.

| Districts.         | Hot-weather period (March to May 1960). |         |             |         |           |         |         |         |         |  | Percentage departure from the normal. |
|--------------------|-----------------------------------------|---------|-------------|---------|-----------|---------|---------|---------|---------|--|---------------------------------------|
|                    | March 1960.                             |         | April 1960. |         | May 1960. |         | Total.  |         |         |  |                                       |
|                    | Normal.                                 | Actual. | Normal.     | Actual. | Normal.   | Actual. | Normal. | Actual. |         |  |                                       |
|                    | (2)                                     | (3)     | (4)         | (5)     | (6)       | (7)     | (8)     | (9)     |         |  |                                       |
| (1)                |                                         |         |             |         |           |         |         |         | (10)    |  |                                       |
| Madras ..          | 7.6                                     | ..      | 15.2        | ..      | 25.5      | 8.1     | 48.3    | 8.1     | — 83.2  |  |                                       |
| Chingleput ..      | 8.8                                     | 3.6     | 15.5        | 5.4*    | 34.0      | 4.9*    | 58.3    | 13.9*   | — 76.2  |  |                                       |
| South Arcot ..     | 12.8                                    | 9.0     | 27.6        | 6.9     | 47.2      | 4.8     | 87.6    | 20.7    | — 76.4  |  |                                       |
| North Arcot ..     | 10.1                                    | 23.2    | 23.5        | 8.1     | 66.6      | 41.6    | 100.2   | 72.9    | — 27.2  |  |                                       |
| Salem ..           | 11.4                                    | 19.0    | 42.6        | 45.7    | 104.8     | 51.0    | 158.8   | 115.7   | — 27.1  |  |                                       |
| Coimbatore ..      | 16.7                                    | 28.2    | 52.5        | 45.6    | 86.5      | 56.0    | 155.7   | 129.8   | — 16.6  |  |                                       |
| Tiruchirappalli .. | 13.1                                    | 8.4     | 41.4        | 47.5    | 74.1      | 62.8    | 128.6   | 118.7   | — 7.7   |  |                                       |
| Thanjavur ..       | 17.7                                    | 3.6     | 37.1        | 35.9    | 50.2      | 35.2    | 105.0   | 74.7    | — 28.9  |  |                                       |
| Madurai ..         | 21.2                                    | 28.6    | 60.1        | 79.6    | 74.3      | 45.0    | 155.6   | 153.2   | — 1.5   |  |                                       |
| Ramanathapuram ..  | 21.7                                    | 11.1    | 53.5        | 109.4   | 49.7      | 68.7    | 124.9   | 189.2   | + 51.5  |  |                                       |
| Tirunelveli ..     | 39.6                                    | 47.5    | 56.1        | 120.0*  | 38.1      | 140.5*  | 133.8   | 308.0*  | + 130.2 |  |                                       |
| The Nilgiris ..    | 35.3                                    | 69.0    | 91.8        | 200.9*  | 151.3     | 110.2*  | 278.4   | 308.1*  | + 36.5  |  |                                       |
| Kanyakumari ..     | 39.6                                    | 45.8    | 101.8       | 99.1    | 136.2     | 334.0   | 277.6   | 478.9   | + 72.5  |  |                                       |

\* Based on Collector's weekly Season reports and liable to revision when monthly reports are received.

\* Based on Collector's weekly Season reports and liable to revision when monthly reports are received.

## APPENDIX No. 2.

## Review of Grow More Food achievements during 1959-60.

During the year under review a total extent of 34.02 lakhs acres was brought to beneficial use under all the intensive Cultivation Schemes as against a finalised target extent of 36.42 lakhs acres. The additional production of cereals realised as verified by the Revenue Officers, was 3.14 lakhs tons as against a finalised target of 3.20 lakhs tons, based on the units of works and supplies actually achieved up to the end of March 1960.

## Intensive Cultivation Scheme—Progress report for the period from 1st April 1959 to 30th June 1960 (1959-60 Schemes).

| Name of the scheme.                  | Number of units distributed as reported by the Collectors from 1st April 1959 to 31st March 1960 |         |           |           |         |         | Total acreage to be covered by the quantity distributed. | (4) | Area achieved or benefited from 1st April 1959 to 30th June 1960 against district button in col. (2). | Additional production (in tons). | (6) |
|--------------------------------------|--------------------------------------------------------------------------------------------------|---------|-----------|-----------|---------|---------|----------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------|----------------------------------|-----|
|                                      | (1)                                                                                              | (2)     | (3)       | (5)       |         |         |                                                          |     |                                                                                                       |                                  |     |
| I. Distribution of fertilisers—      |                                                                                                  |         |           |           |         |         |                                                          |     |                                                                                                       |                                  |     |
| Ammonium Sulphate .. .. .            | ..                                                                                               | 56,737  | 1,588,634 | 1,515,245 | 113,474 | 176,930 |                                                          |     |                                                                                                       |                                  |     |
| Phosphatic manures .. .. .           | ..                                                                                               | 14,032  | 492,896   | 509,127   | 28,064  | 48,811  |                                                          |     |                                                                                                       |                                  |     |
| Total .. .. .                        | ..                                                                                               | 70,769  | 2,081,532 | 2,024,372 | 141,538 | 225,741 |                                                          |     |                                                                                                       |                                  |     |
| II. Distribution of manures—         |                                                                                                  |         |           |           |         |         |                                                          |     |                                                                                                       |                                  |     |
| Rural compost .. .. .                | ..                                                                                               | 317,132 | 63,422    | 83,756    | 7,928   | 11,385  |                                                          |     |                                                                                                       |                                  |     |
| Urban compost .. .. .                | ..                                                                                               | 181,351 | 36,270    | 44,580    | 4,534   | 3,657   |                                                          |     |                                                                                                       |                                  |     |
| Green manure seeds .. .. .           | ..                                                                                               | 5,521   | 414,075   | 357,620   | 36,971  | 22,102  |                                                          |     |                                                                                                       |                                  |     |
| Total .. .. .                        | ..                                                                                               | 503,994 | 513,767   | 435,956   | 49,433  | 37,144  |                                                          |     |                                                                                                       |                                  |     |
| III. Distribution of improved seeds— |                                                                                                  |         |           |           |         |         |                                                          |     |                                                                                                       |                                  |     |
| Paddy seeds .. .. .                  | ..                                                                                               | 14,723  | 662,535   | 631,967   | 59,155  | 35,197  |                                                          |     |                                                                                                       |                                  |     |
| Millet seeds .. .. .                 | ..                                                                                               | 1,955   | 293,250   | 209,095   | 26,183  | 8,941   |                                                          |     |                                                                                                       |                                  |     |
| Total .. .. .                        | ..                                                                                               | 16,678  | 955,785   | 861,062   | 85,338  | 44,138  |                                                          |     |                                                                                                       |                                  |     |
| Grand total .. .. .                  | ..                                                                                               | 591,441 | 3,551,084 | 3,371,390 | 276,309 | 307,023 |                                                          |     |                                                                                                       |                                  |     |

Name of the scheme.

## APPENDIX No. 2—cont.

Intensive Cultivation Scheme—Progress report for the period from 1st April 1959 to 30th June 1960  
(1959-60 Schemes)—cont.

| Name of the schemes.                       | (1) | (2)<br>Number of units<br>distributed as<br>reported by the<br>Collectors from<br>1st April 1959 to<br>31st March 1960. | (3)<br>Total acreage to<br>be covered by the<br>quantity distrib-<br>uted. | (4)<br>Area achieved or<br>benefited from<br>1st April 1959 to<br>30th June 1960<br>against distri-<br>bution in column<br>(2). | (5)<br>Additional produce<br>(in tons). | (6)<br>Additional produce<br>(in tons). |
|--------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| Sinking of Wells .. .. .                   | ..  | 733                                                                                                                     | 165                                                                        | 19                                                                                                                              | 82                                      | 16                                      |
| Construction of new tanks (Z) .. .. .      | ..  | 350                                                                                                                     | 646                                                                        | ..                                                                                                                              | 161                                     | ..                                      |
| Repairs to old tanks (R) .. .. .           | ..  | 40                                                                                                                      | ..                                                                         | 1,067                                                                                                                           | 746                                     | 1,114                                   |
| Pumping Installation.—                     |     |                                                                                                                         |                                                                            |                                                                                                                                 |                                         |                                         |
| 1 Departmental Hiring Scheme .. .. .       | ..  | 101                                                                                                                     | 1,273                                                                      | 3,043                                                                                                                           | 182                                     | 661                                     |
| 2 Hire-purchase scheme .. .. .             | ..  | 166                                                                                                                     | 846                                                                        | 2,357                                                                                                                           | 13                                      | 414                                     |
| Public Works Department .. .. .            | ..  | 25                                                                                                                      | 125                                                                        | 20                                                                                                                              | 62                                      | 10                                      |
| River Pumping Scheme .. .. .               | ..  | 1                                                                                                                       | 100                                                                        | ..                                                                                                                              | 89                                      | ..                                      |
| Tubewells and filter point.. .. .          | ..  | 405                                                                                                                     | 4,350                                                                      | 4,880                                                                                                                           | 2,200                                   | 1,570                                   |
| Special Minor Irrigation Programme .. .. . | ..  | 94,992                                                                                                                  | 71,613                                                                     | 5,585                                                                                                                           | 38,111                                  | 712                                     |
| Conservation of soil .. .. .               | ..  | 168                                                                                                                     | 750                                                                        | 3,722                                                                                                                           | 400                                     | 1,053                                   |
| Cearance and Reclamation—                  |     |                                                                                                                         |                                                                            |                                                                                                                                 |                                         |                                         |
| 1 Departmental Hiring scheme .. .. .       | ..  | 15,385                                                                                                                  | 10,380                                                                     | 8,541                                                                                                                           | 1,193                                   | 545                                     |
| 2 Hire Purchase scheme .. .. .             | ..  | 1,000                                                                                                                   | 329                                                                        | 1,862                                                                                                                           | 287                                     | 445                                     |
| Total (B) .. .. .                          | ..  | 113,063                                                                                                                 | 90,577                                                                     | 31,046                                                                                                                          | 43,526                                  | 6,549                                   |

AGRI.—19

Name of the scheme.

| (1)                                     | (2)<br>Number of units<br>aimed at. | (3)<br>Number of units<br>achieved. Total<br>from 1st April<br>to 30th June<br>1960. | (4)<br>Total acreage to be<br>covered by the<br>quantity to be<br>distributed. | (5)<br>Average actually<br>brought under<br>cultivation from<br>1st April to 30th<br>June 1960 | (6)<br>Additional produce<br>(in tons). | (7)<br>Additional produce<br>(in tons). |
|-----------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| I. Distribution of fertilisers—         |                                     |                                                                                      |                                                                                |                                                                                                |                                         |                                         |
| Ammonium Sulphate. .. .. .              | 41,450                              | 6,694                                                                                | 11,60,600                                                                      | 1,76,329                                                                                       | 82,600                                  | 20,039                                  |
| Phosphatic Manures. .. .. .             | 3,167                               | 1,852                                                                                | 88,676                                                                         | 48,950                                                                                         | 7,306                                   | 14,991                                  |
| Total .. .. .                           | 44,617                              | 8,546                                                                                | 12,49,276                                                                      | 225,279                                                                                        | 89,906                                  | 35,030                                  |
| II. Distribution of manures—            |                                     |                                                                                      |                                                                                |                                                                                                |                                         |                                         |
| Rural Compost .. .. .                   | 3,44,450                            | 82,524                                                                               | 68,888                                                                         | 16,441                                                                                         | 11,776                                  | 2,929                                   |
| Urban Compost .. .. .                   | 93,365                              | 26,529                                                                               | 18,673                                                                         | 5,375                                                                                          | 3,426                                   | 2,007                                   |
| Green manure seeds .. .. .              | 577                                 | 600                                                                                  | 43,275                                                                         | 22,138                                                                                         | 47,987                                  | 1,674                                   |
| Total .. .. .                           | 4,38,392                            | 1,09,653                                                                             | 1,30,836                                                                       | 43,954                                                                                         | 63,189                                  | 6,610                                   |
| III. Distribution of improved<br>seeds— |                                     |                                                                                      |                                                                                |                                                                                                |                                         |                                         |
| Paddy seeds .. .. .                     | 5,044                               | 2,011                                                                                | 226,980                                                                        | 63,281                                                                                         | 18,143                                  | 4,953                                   |
| Millet seeds .. .. .                    | 3,601                               | 514                                                                                  | 540,150                                                                        | 48,315                                                                                         | 13,536                                  | 2,853                                   |
| Total .. .. .                           | 8,645                               | 2,525                                                                                | 767,130                                                                        | 111,596                                                                                        | 31,679                                  | 7,806                                   |
| Grand total .. .. .                     | 4,91,654                            | 120,704                                                                              | 2,147,242                                                                      | 380,829                                                                                        | 184,774                                 | 49,446                                  |

## APPENDIX No. 2—cont.

Intensive Cultivation Scheme—Progress report for the period from 1st April to 30th June 1960  
(1960-61 schemes—3 months)—cont.

| Name of the scheme.                                                       | Number of units aimed at. | Number of units achieved, Total from 1st April to 30th June 1960. | Total acreage to be covered by the quantity to be distributed. | Average actually brought under cultivation from 1st April to 30th June 1960. | Additional production aimed at. | Additional production achieved. |
|---------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| (1)                                                                       | (2)                       | (3)                                                               | (4)                                                            | (5)                                                                          | (6)                             | (7)                             |
| 1 Sinking of wells ..                                                     | 733                       | 26                                                                | ..                                                             | 13                                                                           | 82                              | 13                              |
| 2 Repairs to old tanks (R). ..                                            | 40                        | 1                                                                 | ..                                                             | ..                                                                           | 595                             | ..                              |
| 3 Pumping installation ..                                                 | 438                       | 137                                                               | ..                                                             | 1,114                                                                        | 1,696                           | 296                             |
| 4 River pumping scheme ..                                                 | 5                         | ..                                                                | ..                                                             | ..                                                                           | 355                             | ..                              |
| 5 Tubewells with filter points.                                           | 190                       | 114                                                               | ..                                                             | 980                                                                          | 900                             | 348                             |
| 6 Artesian and tube wells ..                                              | 50                        | 3                                                                 | ..                                                             | ..                                                                           | 1,250                           | ..                              |
| 7 Special minor irrigation programme.                                     | 8,904                     | 325                                                               | ..                                                             | 4,143                                                                        | 14,014                          | 2,637                           |
| 8 Soil conservation and contour bunding.                                  | 4,800                     | 2,425                                                             | ..                                                             | 442                                                                          | ..                              | 1,857                           |
| 9 Clearance and reclamation of waste lands and old fallows with tractors. | 18,400                    | 768                                                               | ..                                                             | 3,330                                                                        | 525                             | 496                             |
|                                                                           | 4                         | ..                                                                | ..                                                             | ..                                                                           | 280                             | ..                              |
| Total                                                                     | 33,865                    | 3,853                                                             | ..                                                             | 10,818                                                                       | 19,940                          | 5,903                           |

## APPENDIX No. 3.

Statement showing the estimates of acreage and yield of food crops in the Madras State in 1959-60.  
1959-60.

| Crop.                                         | Area          |                    | Production.  |                 | Remarks.                                                                                                                                                           |
|-----------------------------------------------|---------------|--------------------|--------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | Acrea.<br>(2) | Hectares.<br>(2 a) | Tons.<br>(3) | Tonne.<br>(3-a) |                                                                                                                                                                    |
| Cereals—                                      |               |                    |              |                 | (4)<br>Yield is in terms of paddy.<br>Figures of yield of millet-<br>are in terms of threshed<br>grain.                                                            |
| Paddy ..                                      | 5,725,000     | 2,317,000          | 5,083,000    | 5,163,180       |                                                                                                                                                                    |
| Cholam ..                                     | 1,750,900     | 708,500            | 336,900      | 545,400         |                                                                                                                                                                    |
| Cumbu ..                                      | 1,254,800     | 507,800            | 308,400      | 313,300         |                                                                                                                                                                    |
| Ragi ..                                       | 871,200       | 352,500            | 336,600      | 342,000         |                                                                                                                                                                    |
| Korra ..                                      | 61,900        | 25,100             | 19,200       | 19,500          |                                                                                                                                                                    |
| Varagu ..                                     | 599,500       | 242,600            | 254,500      | 268,500         |                                                                                                                                                                    |
| Samai ..                                      | 474,000       | 191,800            | 90,400       | 91,800          |                                                                                                                                                                    |
| Maize ..                                      | 13,000        | 5,300              | 5,700        | 5,800           |                                                                                                                                                                    |
| Other cereals (including wheat and barley) .. | 134,500       | 54,455             | 39,540       | 31,030          |                                                                                                                                                                    |
| Total—Cereals ..                              | 10,885,800    | 4,407,055          | 6,665,840    | 6,772,510       |                                                                                                                                                                    |
| Pulses—                                       |               |                    |              |                 | Figures of production of<br>pulses are in terms of<br>unhusked pulses. Except<br>horsegram the estimated<br>loss of weight in husking is<br>20 per cent for pulses |
| Greengram ..                                  | 89,800        | 36,300             | 8,880        | 9,020           |                                                                                                                                                                    |
| Redgram ..                                    | 132,800       | 53,700             | 24,130       | 24,520          |                                                                                                                                                                    |
| Blackgram ..                                  | 98,600        | 39,900             | 13,130       | 13,340          |                                                                                                                                                                    |
| Bengal-ran ..                                 | 6,960         | 2,820              | 1,460        | 1,480           |                                                                                                                                                                    |
| Horsegram ..                                  | 560,000       | 226,600            | 48,600       | 49,400          |                                                                                                                                                                    |
| Other Pulses ..                               | 168,350       | 68,129             | 14,250       | 14,480          |                                                                                                                                                                    |
| Total—Pulses ..                               | 1,056,510     | 427,449            | 110,450      | 112,240         |                                                                                                                                                                    |
| Sugar crops—                                  |               |                    |              |                 | Production is in terms of gur.                                                                                                                                     |
| Sugarcane ..                                  | 144,800       | 58,520             | 408,540      | 415,100         |                                                                                                                                                                    |
| Others ..                                     | 60,900        | 24,645             | 56,200       | 57,100          |                                                                                                                                                                    |
| Total—Sugar crops ..                          | 205,500       | 83,165             | 464,740      | 472,200         |                                                                                                                                                                    |



## APPENDIX No. 3—cont.

Statement showing the estimates of acreage and yield of food crops in the Madras State in 1959-60—cont.

| Crop.                                                         | 1959-60.      |                    |              |                 | Remarks.                                                               |
|---------------------------------------------------------------|---------------|--------------------|--------------|-----------------|------------------------------------------------------------------------|
|                                                               | Area.         |                    | Production.  |                 |                                                                        |
|                                                               | Acrea.<br>(2) | Hectares.<br>(2 a) | Tons.<br>(3) | Tonne.<br>(3 a) |                                                                        |
| (1)                                                           |               |                    |              |                 | (4)                                                                    |
| Condiments and spices—                                        |               |                    |              |                 |                                                                        |
| Chillies .. .. .                                              | 155,300       | 62,848             | 77,400       | 78,640          | Production is in terms of dry<br>chillies, ginger and black<br>pepper. |
| Ginger .. .. .                                                | 1,150         | 465                | 400          | 406             |                                                                        |
| Pepper .. .. .                                                | 540           | 219                | 40           | 41              |                                                                        |
| Others .. .. .                                                | 111,850       | 45,264             | 51,360       | 52,180          |                                                                        |
| Total—Condiments and spices .. ..                             | 268,840       | 108,796            | 129,200      | 131,267         |                                                                        |
| Fruits and vegetables including root<br>Crops—                |               |                    |              |                 |                                                                        |
| Mangoes .. .. .                                               | 61,900        | 25,050             | 205,800      | 209,100         |                                                                        |
| Plantains .. .. .                                             | 80,200        | 32,456             | 191,360      | 194,430         |                                                                        |
| Onions .. .. .                                                | 32,700        | 13,233             | 151,600      | 154,030         |                                                                        |
| Other fruits and vegetables includ-<br>ing root crops .. .. . | 251,600       | 101,819            | 614,000      | 623,850         |                                                                        |
| Total fruits and Vegetables .. ..                             | 426,400       | 172,558            | 1,162,760    | 1,181,410       |                                                                        |
| Other Miscellaneous food crops .. ..                          | 6,500         | 2,630              | 1,800        | 1,830           |                                                                        |
| Total—Food crops .. ..                                        | 12,849,610    | 5,199,653          | 8,534,790    | 8,671,457       |                                                                        |

NOTE.—Figures of area and yield in respect of paddy, cholam, cumbu, ragi, korra, varagu, samai, maize, greengram, redgram, blackgram, bengalgram, horsegram, sugarcane, chillies, ginger, pepper and onions are according to final forecast reports for the year 1959-60. Figures in respect of other crops are only rough estimates.

The estimates of production of paddy, cholam, cumbu and ragi are based on the preliminary results of crop cutting experiments. These are subject to revision with reference to the final survey results.

The estimates of area and production for all the crops shown above are subject to alteration when figures of area as settled at Jamabandi for 1959-60 become available.

## APPENDIX No. 4.

List of improved strains available at the beginning of the period  
(i.e., 1st July 1959).

## (a) PADDY.

| Stations.                                        | Number of strains.     |                   |
|--------------------------------------------------|------------------------|-------------------|
|                                                  | By pureline selection. | By hybridization. |
| 1 Paddy Breeding Station, Coimbatore .. ..       | 23                     | 5                 |
| 2 Agricultural Research Station, Aduthurai .. .. | 22                     | 3                 |
| 3 Rice Research Station, Tirurkuppam .. ..       | 5                      | 1                 |
| 4 Rice Research Station, Ambasamudram .. ..      | 10                     | 1                 |
| 5 Agricultural Research Station, Palur .. ..     | 2                      | ..                |
| Total .. ..                                      | 62                     | 10                |

List of new strains released during the period ending 30th June 1960—Nil.

## (b) MILLETS.

| Crops.             | Number of improved strains. |        |            |             | Total. |
|--------------------|-----------------------------|--------|------------|-------------|--------|
|                    | Coimbatore.                 | Palur. | Koilpatti. | Tirupattur. |        |
| (1)                | (2)                         | (3)    | (4)        | (5)         | (6)    |
| Cholam .. .. .     | 19                          | ..     | 3          | 2           | 24     |
| Cumbu .. .. .      | 8                           | ..     | 1          | ..          | 9      |
| Ragi .. .. .       | 7                           | 1      | 2          | ..          | 10     |
| Tenai .. .. .      | 3                           | ..     | ..         | ..          | 3      |
| Varagu .. .. .     | 1                           | 1      | ..         | ..          | 2      |
| Panivaragu .. .. . | 1                           | ..     | ..         | ..          | 1      |
| Samai .. .. .      | 1                           | ..     | ..         | ..          | 1      |
| Pulses .. .. .     | 4                           | ..     | ..         | ..          | 4      |
| Total .. ..        | 44                          | 2      | 6          | 2           | 54     |

List of new strains of millets and pulses released during  
the year 1959-60—Nil.

## (c) OILSEEDS.

## A. Groundnut.

- (a) Available at the beginning of the year—  
 TMV. 1 }  
 TMV. 2 } Under large scale distribution.  
 TMV. 3 }  
 TMV. 4 }

A.H. 6783 } These four selections with spreading habit were tested in  
 A.H. 6786 } twelve centres in Chingleput, South Arcot, Salem and  
 A.H. 6795 } Tiruchirappalli districts. They gave 5.8 to 66.7 per cent  
 A.H. 6826 } increased yield over the local varieties.

## APPENDIX No. 4—cont

## (c) OILSEEDS—cont.

## A. Groundnut—cont.

- A.H. 6608 } These four semi-spreading selections were tested in four  
 A.H. 6609 } centres in Mathurai and Ramanathapuram districts, where  
 A.H. 6614 } they recorded increased yields ranging from 3.4 to 77.8  
 A.H. 6615 } per cent over the local varieties.  
 A.H. 3490 } These three bunch selections were tested in ten centres in  
 A.H. 6179 } North Arcot and Tirunelveli districts, where they registered  
 A.H. 6279 } increased yields ranging from 8.7 to 91.7 per cent over the  
 local bunch.

## (b) Evolved during the year—

AH. 6857 A spreading selection issued for trials during 1960.

## B. Gingelly.

## (a) Available at the beginning of the year—

- TMV. 1 }  
 TMV. 2 } Under large scale multiplication.  
 TMV. 3 }

## (b) Evolved during the year—Nil.

## C. Castor.

## (a) Available at the beginning of the year—

- TMV. 1 }  
 TMV. 2 } Under large scale distribution.  
 TMV. 3 }

- R.C. 1074 } These were tested in sixteen centres in Salem, Madurai,  
 R.C. 1075 } and North Arcot districts. They recorded increased yields  
 R.C. 1076 } ranging from 4.9 to 16.3 per cent in Madurai, 34.4 to 98.8  
 per cent in North Arcot and 97.8 to 176.9 per cent in  
 Salem district over the local varieties.

## (b) Evolved during the year—

- R.C. 1146 } Two short duration selections from progenies of crosses maturing  
 R.C. 1147 } in 5½ months were issued for trials during 1960.

## D. Sugarcane.

## 1. List of improved strains available at the beginning of the period.

Varieties Co. 658, Co. 740, and Co. 785 were available at the beginning of the period.

## 2. List of improved strains released during the period.

Variety Co. 658 was released for cultivation both for Main and Adali season plantings.

## E. Cotton.

## 1. List of improved strains available at the beginning of the period.

- 1 Madras Cambodia Uganda 1 .. .. . MCU. 1.  
 2 Madras Cambodia Uganda 2 .. .. . MCU. 2.  
 3 Madras Cambodia Uganda 3 .. .. . MCU. 3.  
 4 P. 216 F .. .. .  
 5 Karunganni 2 .. .. . K. 2.  
 6 Karunganni 5 .. .. . K. 3.  
 7 Karunganni 6 (Pandyan) .. .. . K. 4.

## 2. List of improved strains released during the period—Nil.

## APPENDIX No. 5.

## Estimated area covered by improved strain, of crops 1959-60.

| Name of the crops. | Area under the crop in million acres. | Area covered by improved strains including natural spread in million acres. | Percentage of spread. |
|--------------------|---------------------------------------|-----------------------------------------------------------------------------|-----------------------|
| (1)                | (2)                                   | (3)                                                                         | (4)                   |
| Crops—             |                                       |                                                                             |                       |
| Paddy .. ..        | 5.04                                  | 3.06                                                                        | 63                    |
| Cholam .. ..       | 1.85                                  | 1.01                                                                        | 54.7                  |
| Cumbu .. ..        | 1.49                                  | 0.85                                                                        | 57.6                  |
| Ragi .. ..         | 0.81                                  | 0.65                                                                        | 73.4                  |
| Minor millets ..   | 1.47                                  | 0.39                                                                        | 26.9                  |
| Pulses .. ..       | 1.08                                  | 0.33                                                                        | 31.4                  |
| Groundnut .. ..    | 1.85                                  | 0.54                                                                        | 24.3                  |
| Gingelly .. ..     | 0.38                                  | 0.12                                                                        | 32.8                  |
| Castor .. ..       | 0.04                                  | 0.03                                                                        | 74.6                  |
| Sugarcane .. ..    | 0.144                                 | 0.140                                                                       | 97                    |
| Cotton—            |                                       |                                                                             |                       |
| K. 2 .. .. }       | 0.32                                  | 0.33                                                                        | 82                    |
| K. 6 .. .. }       |                                       |                                                                             |                       |
| MCU. 2 .. ..       | 0.05                                  | 0.07                                                                        | 93                    |
| K. 5 .. ..         | 0.187                                 | 0.185                                                                       | 99                    |
| MCU. 1 .. ..       | 0.03                                  | 0.21                                                                        | 70                    |
| 216 F .. ..        | 0.07                                  | Multiplication of seeds is in progress.                                     |                       |

## APPENDIX No. 6.

## Statement showing the Second Five-year Plan Schemes, targets and achievements.

| Serial number and<br>name of scheme.     | Item.                                                         | Unit.  | Physical targets.                |                 |                 |                 |                           | Achieve-<br>ment,<br>1959-60.<br>(9) |
|------------------------------------------|---------------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|-----------------|---------------------------|--------------------------------------|
|                                          |                                                               |        | Second<br>Plan<br>target.<br>(4) | Achievements.   |                 |                 | Target<br>1959-60.<br>(8) |                                      |
|                                          |                                                               |        |                                  | 1956-57.<br>(5) | 1957-58.<br>(6) | 1958-59.<br>(7) |                           |                                      |
| (1)                                      | (2)                                                           | (3)    | (4)                              | (5)             | (6)             | (7)             | (8)                       | (9)                                  |
| I. Seed Farms—                           |                                                               |        |                                  |                 |                 |                 |                           |                                      |
| Opening of State Seed<br>Farms.          | (i) Farms opened.                                             | Nos.   | 210<br>(revised).                | 37              | 127             | 11              | 41                        | 36                                   |
|                                          | (ii) Number now<br>existing.                                  | ..     | ..                               | 15              | 68              | 11              | ..                        | 36                                   |
| II. Supply Schemes and Plant Protection— |                                                               |        |                                  |                 |                 |                 |                           |                                      |
| (1) Green Manure seeds.                  | Green manure seeds<br>distributed.                            | Tons.  | 1,532                            | 599             | 1,028           | 957             | 1,342                     | 1,305                                |
|                                          | Area covered ..                                               | Acres. | 3,830,000                        | 1,497,500       | 2,570,000       | 143,550         | 201,300                   | 195,750                              |
|                                          | Additional produc-<br>tion.                                   | Tons.  | 341,636                          | 133,577         | 229,244         | 14,355          | 20,130                    | 19,575                               |
| (2) Paddy and Millet<br>seeds.           | Paddy: Primary<br>Seed Farms—<br>Quantity distri-<br>buted.   | Tons.  | 13,250                           | 702             | 1,341           | 1,839           | 2,650                     | 2,282                                |
|                                          | Area covered ..                                               | Acres. | 596,250                          | 31,590          | 60,345          | 82,755          | 119,250                   | 102,690                              |
|                                          | Additional pro-<br>duction.                                   | Tons.  | 59,625                           | 3,159           | 6,034           | 8,275           | 11,925                    | 10,269                               |
|                                          | Village seed Farms—<br>Quantity distri-<br>buted.             | Tons.  | 115,470                          | 7,960           | 17,706          | 15,586          | 26,500                    | 23,182                               |
|                                          | Area covered ..                                               | Acres. | 5,196,150                        | 358,200         | 796,770         | 701,370         | 1,192,500                 | 1,043,190                            |
|                                          | Additional Pro-<br>duction.                                   | Tons.  | 519,615                          | 35,820          | 79,677          | 70,137          | 119,250                   | 104,319                              |
|                                          | Millets: Primary<br>Seed Farms—<br>Quantity distri-<br>buted. | Tons.  | 2,500                            | 31              | 187             | 164             | 500                       | 230                                  |
|                                          | Area covered ..                                               | Acres. | 375,000                          | 4,650           | 28,050          | 24,600          | 75,000                    | 34,500                               |
|                                          | Additional Pro-<br>duction.                                   | Tons.  | 21,175                           | 263             | 1,584           | 1,389           | 4,235                     | 1,948                                |
|                                          | Village Seed Farms—<br>Quantity distri-<br>buted.             | Tons.  | 11,500                           | 275             | 1,254           | 1,134           | 2,500                     | 2,207                                |
|                                          | Area covered ..                                               | Acres. | 1,725,000                        | 41,250          | 188,100         | 170,100         | 375,000                   | 331,050                              |
|                                          | Additional produc-<br>tion.                                   | Tons.  | 97,405                           | 2,329           | 10,621          | 9,604           | 21,175                    | 18,693                               |
| (3) (a) Plant produc-<br>tion—           | Crop area covered ..                                          | Acres. | 335,000<br>(each year)           | 415,060         | 574,775         | 820,796         | 335,000                   | 1,068,186                            |
| (b) Dusters and<br>Sprayers.             | Estimated additional<br>production.                           | Tons.  | 12,306<br>(each year)            | 9,445           | 14,670          | 27,048          | 12,306                    | 54,091                               |
|                                          | Sprayers ..                                                   | Nos.   | ..                               | ..              | 500             | 2,000           | 2,500                     | 2,394*                               |
|                                          | Dusters ..                                                    | ..     | ..                               | ..              | 200             | ..              | 500                       | 8,816†                               |
| (4) Urban Compost                        | Quantity distributed.                                         | Tons.  | 390,400                          | 253,039         | 259,125         | 279,799         | 395,250                   | 3,37,451                             |
|                                          | Area covered ..                                               | Acres. | 78,080                           | 50,608          | 51,825          | 55,960          | 79,050                    | 67,490                               |
|                                          | Additional produc-<br>tion.                                   | Tons.  | 9,760                            | 6,326           | 6,478           | 6,995           | 9,881                     | 8,436†                               |
| (5) Local<br>resources.                  | Quantity distributed.                                         | Tons.  | 1,168,000                        | ..              | ..              | 775,584         | 1,048,000                 | 1,398,426†                           |
|                                          | Area covered ..                                               | Acres. | 233,600                          | ..              | ..              | 155,117         | 209,600                   | 279,685†                             |
|                                          | Additional produc-<br>tion.                                   | Tons.  | 29,200                           | ..              | ..              | 19,390          | 26,200                    | 34,961†                              |

\* Number purchased.

† Number distributed to roots up to March 1960.

‡ 1959-60 achievement figures under compost furnished are tentative.

APPENDIX No. 6—*cont.*

*Statement showing the Second Five-year Plan Schemes, targets and achievements—cont.*

| Serial number and name of scheme.              | Item.                  | Unit.  | Achievements.          |                 |                 |                            | Target.<br>1959-60.<br>(8)                                  | Achievements.<br>1959-60.<br>(9)                         |
|------------------------------------------------|------------------------|--------|------------------------|-----------------|-----------------|----------------------------|-------------------------------------------------------------|----------------------------------------------------------|
|                                                |                        |        | 1956-57.<br>(5)        | 1957-58.<br>(6) | 1958-59.<br>(7) | Second Plan target.<br>(4) |                                                             |                                                          |
| II. Supply Schemes and Plant Protection--cont. |                        |        |                        |                 |                 |                            |                                                             |                                                          |
| (6) Nightsoil Compost ..                       | Quantity distributed.  | Tons.  | 390,000<br>(each year) | ..              | ..              | ..                         | 240,000                                                     | 15, 89*                                                  |
|                                                | Area covered ..        | Acres. | ..                     | ..              | ..              | ..                         | 48,000                                                      | 3,058                                                    |
|                                                | Additional production. | Tons.  | ..                     | ..              | ..              | ..                         | 6,000                                                       | 382                                                      |
| (Scheme merged with local manurial resources.) |                        |        |                        |                 |                 |                            |                                                             |                                                          |
| (7) Rural Compost ..                           | ..                     | ..     | ..                     | ..              | ..              | ..                         | ..                                                          | ..                                                       |
| (8) Night Soil Compost in smaller villages.    | ..                     | ..     | ..                     | ..              | ..              | ..                         | ..                                                          | ..                                                       |
| (9) Japanese scheme for destruction of rats.   | Area covered ..        | Acres. | 4,745,000              | 1,167,148       | 1,634,264       | ..                         | 250,000                                                     | 1,676,414                                                |
|                                                | Additional production. | Tons.  | 190,647                | 27,844          | 46,888          | ..                         | 100,448                                                     | 87,356                                                   |
| (10) Plot scheme for destruction of rats.      | ..                     | Acres. | ..                     | ..              | 300             | ..                         | 30,000                                                      | 300                                                      |
| III. Development for commercial crops, etc.--  |                        |        |                        |                 |                 |                            |                                                             |                                                          |
| (1) Horticulture ..                            | (Loans Rs. in lakhs).  | ..     | ..                     | ..              | ..              | 0.044                      | L.T. Rs. 2.10<br>(700 acres.)<br>S.T. 1.95<br>(3,000 acres) | Rs. 1,57,280<br>(525 acres)<br>Rs. 16,100<br>(285 acres) |

### III. Development for commercial crops, etc.

(1) Horticulture .. (Loans Rs. in lakhs).

|       |                               |                             |
|-------|-------------------------------|-----------------------------|
| 0-044 | L.T. Rs. 2-10<br>(700 acres.) | Rs. 1,57,220<br>(525 acres) |
|       | S.T. 1-95<br>(3,000 acres)    | Rs. 16,100<br>(285 acres)   |

| AGRICULTURAL DEPARTMENT                    |    |                                                 |                       |           |         |         |         |                                                         |                                   |
|--------------------------------------------|----|-------------------------------------------------|-----------------------|-----------|---------|---------|---------|---------------------------------------------------------|-----------------------------------|
| (2) Oilseed-                               | .. | Coverage of area in acres:                      |                       |           |         |         |         |                                                         |                                   |
|                                            |    | (i) Development scheme (Plans, etc.)            | Acres.                | 105,822   | 164,761 | 273,645 | 432,319 | ..                                                      |                                   |
|                                            |    | (ii) Extension scheme (Non-Plan scheme).        | Do.                   | 602,000   | ..      | 11,818  | 127,725 | ..                                                      |                                   |
| Additional productions:                    |    |                                                 |                       |           |         |         |         |                                                         |                                   |
|                                            |    | (i) Development scheme (with Five-Year Plan).   | Tons.                 | 70,000    | 14,808  | 23,288  | 43,584  |                                                         |                                   |
|                                            |    | (ii) Extension scheme (outside Five-Year Plan). | Do.                   | 96,000    | 2,445   | 23,063  | ..      | 153,530                                                 | 120,046                           |
| (3) Cashewnut scheme (Non-Forest areas).   |    | Area covered                                    | Acres.                | ..        | ..      | ..      | ..      | 7,000                                                   | 650                               |
|                                            |    | Quantity distributed.                           | Lb.                   | ..        | ..      | ..      | ..      | 21,000                                                  | 1,950                             |
|                                            |    | Loans distributed.                              | Ra.                   | ..        | ..      | ..      | ..      | 580,000                                                 | 52,010                            |
|                                            |    | General seed distribution.                      | Lb.                   | ..        | ..      | ..      | ..      | ..                                                      | 4,363                             |
| (4) Sugarcane Development and zonal farms. |    | Additional production.                          | Tons.                 | 1,000,000 | 176,672 | 236,844 | 217,102 | 194,420                                                 | 170,676                           |
| (5) Road Development ..                    |    | Improvement to roads.                           | Miles.                | 80        | ..      | 27      | ..      | Target (a) 28.3 miles. (b) 28 culverts. (c) 1 causeway. | Achievements, 35 18 456 feet.     |
| (6) Cotton                                 | .. | Additional production.                          | Bales of 392 lb. each | 155,000   | 31,596  | 60,762  | 64,755  | 128,000                                                 | 73,032 (Up to end of April 1960). |
|                                            |    |                                                 |                       |           |         |         |         | (Cumulative)                                            |                                   |

\* 1959-60 achievement figures under compost furnished are tentative.  
L.T.—Longs term loans. S.T.—Short term loans.

APPENDIX No. 6—cont.

| Serial number and name of scheme.                 | Items.                       | Unit.      | Physical targets.   |              |                 |          | Achievements, 1959-60. |
|---------------------------------------------------|------------------------------|------------|---------------------|--------------|-----------------|----------|------------------------|
|                                                   |                              |            | Second Plan target. | Achievements |                 |          |                        |
| (1)                                               | (2)                          | (3)        | (4)                 | (5)          | (6)             | (7)      | (8)                    |
| III. Development for commercial crops, etc.—cont. |                              |            |                     |              |                 |          |                        |
| (7) Coconut Station, Tanjore.                     | Coconut Farm established.    | No.        | 2                   | ..           | 1 (continuance) | 1958-59. | 1959-60.               |
|                                                   | Research works               | No.        | 4                   | ..           | 4 (continuance) |          |                        |
| (8) Coconut Nurseries                             | Seedlings                    | No.        | 126,000             | 28,998       | 32,951          | 57,543   | 99,965                 |
| (9) Coconut in Kazhuvelli area.                   | No physical Target.          | No.        |                     |              |                 |          | 4 Demonstration Farms. |
| (10) Parasite Breeding Station.                   | Parasites released:          | Nos.       | 25,000              | ..           | ..              | 706,723  | 109,071                |
|                                                   | Nagareoil                    | Nos.       | 25,000              | ..           | ..              | 16,520   | 1,099,980              |
|                                                   | Gudiyatham                   | Trees Nos. |                     |              |                 |          | 80,000                 |
| (11) Increasing Coconut Oil production.           | Adoption of various methods. | Acres.     |                     |              |                 |          | 37,500                 |
|                                                   | Cultural practices.          |            |                     |              |                 |          | 37,500                 |
|                                                   | Fertilizers.                 |            |                     |              |                 |          | 36,948.55              |
|                                                   | Plant protections.           |            |                     |              |                 |          | 50,000                 |
|                                                   | Irrigation facilities.       |            |                     |              |                 |          | 36,240.25              |
|                                                   |                              |            |                     |              |                 |          | 15,000                 |
|                                                   |                              |            |                     |              |                 |          | 46,651.00              |
| (12) Coconut cultivation in Ramanathapuram.       | (1) Development part—        |            |                     |              |                 |          | 37,500                 |
|                                                   | (i) Allottees                |            | ..                  | ..           | ..              | ..       | 50                     |
|                                                   | (ii) Acres                   |            | ..                  | ..           | ..              | ..       | 250                    |
|                                                   | (iii) Loan                   |            | ..                  | ..           | ..              | ..       | 50,000                 |
|                                                   | (2) Nursery part—            |            |                     |              |                 |          |                        |
|                                                   | (i) Seednuts procurement.    |            | ..                  | ..           | ..              | ..       | 24,000                 |
|                                                   | (ii) Distribution.           |            | ..                  | ..           | ..              | ..       | 18,000                 |
|                                                   |                              |            |                     |              |                 |          | 7,855                  |
|                                                   |                              |            |                     |              |                 |          | NIL                    |

|                                          | No. | Nurseries | No. | One centre<br>in func- |
|------------------------------------------|-----|-----------|-----|------------------------|
| 13 More Regional Orchards cum-Nurseries. | ..  | ..        | ..  | 44 centres             |

| 14 Small scale fruit preservation units. | No. | Rs. | The scheme started.                    |
|------------------------------------------|-----|-----|----------------------------------------|
| 14 Small scale fruit preservation units. | ..  | ..  | Rs. 50,000 The scheme has not started. |

|                                       | Nos. | 50<br>per year | 24 | 37<br>mented. |
|---------------------------------------|------|----------------|----|---------------|
| 15 Training of Gardeners. Trainees .. | ..   | ..             | 36 | 30            |

| 16 Tobacco Research Scheme. |                                                 | : per year) |        |
|-----------------------------|-------------------------------------------------|-------------|--------|
| Meenappallyam Tobacco.      | Institution established.<br>Research workers .. | No.<br>Nos. | 1<br>2 |
| Kanyakumari district.       | Area ..                                         | Acres.      | 1,000  |
|                             |                                                 |             | 205-74 |

| IV. Agricultural Education—    |                    |    |    |
|--------------------------------|--------------------|----|----|
| (1) Strengthening of Buildings | Percentage of work |    |    |
| Agricultural College.          | 25                 | 25 | 25 |

| Buildings ..                   | Percentage of work completed. | ..             |
|--------------------------------|-------------------------------|----------------|
| Additional capacity created.   | 54                            | 54 (per year)  |
| Additional students submitted. | 54                            | 54 (each year) |

|                                                    |  |    |    |    |    |
|----------------------------------------------------|--|----|----|----|----|
| (2) Scheme for upgrading the Agricultural College. |  | .. | .. | .. | .. |
| Statistical Section,                               |  | .. | .. | .. | .. |
| X-ray Unit.                                        |  | .. | .. | .. | .. |
| Purchase of Technical Books and Farm Equipment.    |  | .. | .. | .. | .. |
| Research workers ..                                |  | .. | .. | .. | .. |

## APPENDIX NO. 6—cont.

## Statement showing the Second Five-year Plan Schemes, targets and achievements—cont.

| Serial number and name of scheme.                                                                    | Item.                                            | Unit.                           | Physical targets.   |                                              |          |                                         | Achievement, 1959-60.                         |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------|---------------------|----------------------------------------------|----------|-----------------------------------------|-----------------------------------------------|
|                                                                                                      |                                                  |                                 | Second Plan target. | Achievements, 1956-57.                       | 1957-58. | 1958-59.                                |                                               |
| (1)                                                                                                  | (2)                                              | (3)                             | (4)                 | (5)                                          | (6)      | (7)                                     | (8)                                           |
| IV. Agricultural Education—cont.                                                                     |                                                  |                                 |                     |                                              |          |                                         |                                               |
| (3) Scheme for upgrading Agricultural College and Research Institute into a Post-graduate Institute. | Student trainees ..<br>Work (construction)       | No. ..<br>Percentage completed. | 40<br>(each year).  | ..                                           | ..       | 40<br>4                                 | 39<br>96<br>(one resigned)<br>75<br>per cent. |
| (4) Strengthening Agricultural Department.                                                           | ..                                               | ..                              | ..                  | ..                                           | ..       | ..                                      | ..                                            |
| V. Agricultural Research, Information, etc.—                                                         |                                                  |                                 |                     |                                              |          |                                         |                                               |
| (1) Agricultural Information.                                                                        | No target ..                                     | ..                              | ..                  | ..                                           | ..       | ..                                      | ..                                            |
| (2) Betelvine Wilt ..                                                                                | Institutions established.<br>Research workers .. | No.<br>No.                      | 1<br>2              | 1<br>2<br>(continuation.)<br>(continuation.) | 1<br>2   | 1<br>2                                  | 1<br>2                                        |
| (3) Gur manufacture.                                                                                 | Institutions established.<br>Research workers..  | No.<br>No.                      | 1<br>1              | 1<br>..                                      | 1<br>1   | 1<br>(continuation.)<br>(continuation.) | 1<br>1                                        |

|                                                                                               |                                                  |                                    |                   |          |         |                            |         |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------|-------------------|----------|---------|----------------------------|---------|
| (4) Manual trials on ryots fields.                                                            | Research workers ..                              | No.                                | 36                | ..       | ..      | 4<br>(continuation.)       | 4       |
| (a) Seed testing station.                                                                     | ..                                               | ..                                 | (Scheme deferred) | ..       | ..      | ..                         | ..      |
| (5) Sugarcane research.                                                                       | Institutions established.<br>Research workers .. | No.<br>No.                         | 3<br>36           | 2<br>24  | 3<br>36 | 3<br>36<br>(continuation.) | 3<br>36 |
| (6) Regional Research Fruit Station.                                                          | Institution established.<br>Research workers ..  | No.<br>No.                         | 1<br>7            | ..<br>.. | 1<br>7  | 1<br>7<br>(continuation.)  | 1<br>7  |
| (7) Banana Research Scheme.                                                                   | Institutions established.<br>Research workers .. | No.<br>No.                         | 1<br>5            | ..<br>.. | 1<br>5  | 1<br>5<br>(continuation.)  | 1<br>5  |
| (8) Model Agronomic Experiments at Agricultural Research Station, Aduthurai and Bhavanisagar. | Research workers ..                              | No.                                | 3                 | 3        | 8       | 8                          | 8       |
| VI. Minor Irrigation—                                                                         |                                                  |                                    |                   |          |         |                            |         |
| Sinking of tube wells and artesian wells.                                                     | ..                                               | (i) No.                            | 3,000             | 507      | 321     | 644                        | 622     |
| Filter point scheme                                                                           | ..                                               | (ii) Area in acres.                | 30,000            | 5,070    | 3,210   | 6,400                      | 6,220   |
|                                                                                               | ..                                               | (iii) Additional production. Tons. | 15,000            | 2,335    | 1,605   | 3,220                      | 3,110   |

APPENDIX No. 6—cont.  
Statement showing the Second Five-year Plan Schemes, targets and achievements—cont.

| Serial number and<br>name of scheme.                | Item.                                                                                                          | Unit.                                       | physical targets.    |                       |                        |                        |                     | Achieve-<br>ment,<br>1959-60. |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------|-----------------------|------------------------|------------------------|---------------------|-------------------------------|
|                                                     |                                                                                                                |                                             | Achievements.        |                       |                        |                        |                     |                               |
|                                                     |                                                                                                                |                                             | 1956-57.             | 1957-58.              | 1958-59.               | Target<br>1959-60.     |                     |                               |
| (1)                                                 | (2)                                                                                                            | (3)                                         | (4)                  | (5)                   | (6)                    | (7)                    | (8)                 | (9)                           |
| VI. Minor Irrigation—cont.                          |                                                                                                                |                                             |                      |                       |                        |                        |                     |                               |
| River pumping .. ..                                 | ..                                                                                                             | (i) Nos.<br>(ii) Acres.<br>(iii) Tons.      | 30<br>3,000<br>2,667 | ..<br>..<br>..        | ..<br>..<br>..         | 2<br>140<br>124        | 6<br>600<br>533     | ..<br>..<br>..                |
| Lift Irrigation (Hiring). Oil engines..             | ..                                                                                                             | Nos.<br>Acres.<br>Additional<br>production. | ..<br>..<br>..       | 290<br>8,585<br>2,862 | 290<br>10,719<br>3,573 | 290<br>10,252<br>3,419 | 290<br>2,320<br>773 | 290<br>10,525<br>3,508        |
| Lift Irrigation (hire pur-<br>chase). Oil engines.. | ..                                                                                                             | Nos.                                        | 655                  | 70                    | 16                     | 50                     | 175                 | 104                           |
| Electric Motors ..                                  | ..                                                                                                             | Nos.                                        | 1,785                | 314                   | 107                    | 171                    | 475                 | 275                           |
| Area covered ..                                     | ..                                                                                                             | Acres.                                      | ..                   | 2,130                 | 663                    | 1,255                  | 3,775               | 2,207                         |
| Additional produc-<br>tion.                         | ..                                                                                                             | Tons.                                       | ..                   | 1,063                 | 331                    | 627                    | 1,888               | 1,104                         |
| Land Development—                                   |                                                                                                                |                                             |                      |                       |                        |                        |                     |                               |
| Tractor Hiring scheme..                             | Virgin (Area in<br>Acres).                                                                                     | Acres.                                      | 67,600               | 4,405                 | 4,854                  | 4,812                  | 13,500              | 5,435                         |
|                                                     | Current fallows<br>(area in acres).                                                                            | Acres.                                      | 95,000               | 20,035                | 15,088                 | 2,445                  | 19,000              | 9,356                         |
| Tractor Hire-purchase system.                       |                                                                                                                |                                             |                      |                       |                        |                        |                     |                               |
|                                                     | Virgin (Estimated<br>additional produc-<br>tion).<br>Current fallows<br>(Estimated addi-<br>tional production) | Tons.                                       | 16,875               | 3,104                 | 2,722                  | 1,203                  | 3,375               | 1,358                         |
|                                                     | Reclamation of land.                                                                                           | No.                                         | ..                   | 22                    | 14                     | 7                      | 50                  | ..                            |
|                                                     | Area covered ..                                                                                                | Acres.                                      | ..                   | 8,800                 | 5,600                  | 2,800                  | 20,000              | ..                            |
|                                                     | Additional produc-<br>tion.                                                                                    | Tons.                                       | ..                   | 1,540                 | 980                    | 490                    | 3,500               | ..                            |
| Soil conservation in Area in acres                  |                                                                                                                |                                             |                      |                       |                        |                        |                     |                               |
| Agricultural lands.                                 |                                                                                                                |                                             |                      |                       |                        |                        |                     |                               |
|                                                     | (i) Hills ..                                                                                                   | ..                                          | 7,899                | 854                   | 1,244                  | 1,891                  | 1,793               | 1,822                         |
|                                                     | (ii) Plains ..                                                                                                 | ..                                          | 93,219               | 13,964                | 16,262                 | 14,115                 | 29,783              | 28,362                        |
|                                                     | Additional produc-<br>tion.                                                                                    | Tons.                                       | 10,820               | 1,147                 | 1,537                  | 2,257                  | 2,918               | 2,625                         |

## APPENDIX No. 6—cont.

## Statement showing the Second Five-year Plan Schemes, targets and achievements—cont.

| Serial number and name of the scheme.           | Expenditure (in lakhs). |              |              |              |                           |                      |  |
|-------------------------------------------------|-------------------------|--------------|--------------|--------------|---------------------------|----------------------|--|
|                                                 | Second Plan provision.  | Actuals.     |              |              | Budget estimate, 1959-60. | Anticipated actuals. |  |
|                                                 |                         | 1958-57.     | 1957-58.     | 1958-59.     |                           |                      |  |
| (1)                                             | (2)                     | (3)          | (4)          | (5)          | (6)                       | (7)                  |  |
| <b>I. Seed Farms—</b>                           |                         |              |              |              |                           |                      |  |
| 1 Opening of State Seed Farms .. ..             | N. 86.89                | 1.47         | 19.05        | 11.26        | 42.04                     | 7.73                 |  |
| <b>II. Supply schemes and Plant Protection—</b> |                         |              |              |              |                           |                      |  |
| 1 Green Manure Seeds .. ..                      | N. 1.91                 | 0.01         | 0.63         | 0.41         | 6.60                      | 1.66                 |  |
| 2 Paddy and Millet seeds .. ..                  | N. 6.62                 | (—) 0.92     | (—) 1.06     | (—) 4.64     | (—) 0.32                  | 0.87                 |  |
| 3 (a) Plant Protection .. ..                    | N. 13.10                | 9.14         | 6.94         | 12.47        | 4.26                      | 14.52                |  |
| (b) Dusters and Sprayers .. ..                  | N. ..                   | ..           | 0.67         | 2.51         | 1.00                      | 2.08                 |  |
| 4 Urban Compost .. ..                           | N. 22.87                | 2.06         | 5.67         | 7.35         | 12.81                     | 10.39                |  |
| 5 Local Manurial Resources .. ..                | N. ..                   | ..           | 0.95         | 2.51         | 3.00                      | 2.65                 |  |
| 6 Nightsoil Compost .. ..                       | N. ..                   | ..           | 0.04         | 2.29         | 8.50                      | 6.86                 |  |
| 7 Rural Compost .. ..                           | N. 0.08*                | ..           | ..           | ..           | ..                        | ..                   |  |
| 8 Nightsoil Compost in smaller villages .. ..   | N. ..                   | ..           | ..           | ..           | ..                        | 1.33                 |  |
| 9 Japanese scheme for destruction of rats .. .. | N. ..                   | ..           | ..           | ..           | ..                        | ..                   |  |
| 10 Pilot Scheme for destruction of rats .. ..   | N. ..                   | ..           | ..           | 0.02         | 0.12                      | ..                   |  |
| <b>Total .. ..</b>                              | <b>N. 44.58</b>         | <b>10.29</b> | <b>13.84</b> | <b>22.92</b> | <b>36.61</b>              | <b>40.36</b>         |  |

## AGRICULTURAL DEPARTMENT

## III. Development for commercial crops, etc.—

|                                                |                 |             |             |              |              |              |  |
|------------------------------------------------|-----------------|-------------|-------------|--------------|--------------|--------------|--|
| 1 Horticulture .. ..                           | N. 24.68        | ..          | 0.03        | 0.37         | 2.73         | 2.45         |  |
| 2 Oilseeds .. ..                               | N. 3.19         | 0.75        | 0.17        | 0.20         | 0.46         | 0.76         |  |
| 3 Cashewnut Scheme (Non-Forest Areas) .. ..    | N. 3.47         | ..          | ..          | 0.01         | ..           | 0.64         |  |
| 4 Sugarcane Development and Zonal Farms ..{    | N. 24.39        | 0.83        | 1.87        | 3.97         | 2.77         | 5.09         |  |
| 5 Road Development .. ..                       | N. ..           | ..          | 0.12        | 0.24         | 0.28         | 0.26         |  |
| 6 Cotton .. ..                                 | N. 4.82         | 1.27        | 0.04        | 2.93         | 7.84         | 8.23         |  |
| 7 Coconut Station, Thanjavur .. ..             | N. ..           | ..          | 0.52        | 0.58         | 1.48         | 0.73         |  |
| 8 Coconut Nurseries .. ..                      | N. 9.53         | 0.60        | ..          | 1.24         | 0.12         | 0.22         |  |
| 9 Coconut in Kazhuvelli Area .. ..             | N. ..           | ..          | 0.16        | 0.60         | 0.66         | 0.26         |  |
| 10 Parasite Breeding Station .. ..             | N. ..           | ..          | ..          | ..           | 0.74         | 0.12         |  |
| 11 Increasing Coconut Oil Production .. ..     | N. ..           | ..          | ..          | 0.08         | 0.14         | 0.17         |  |
| 12 Coconut cultivation in Ramanathapuram .. .. | N. ..           | ..          | ..          | 0.17         | 0.33         | 0.30         |  |
| 13 More Regional Orchards—cum—Nurseries .. ..  | N. ..           | ..          | ..          | ..           | ..           | 0.10         |  |
| 14 Small-scale Fruit Preservation Units .. ..  | N. ..           | ..          | ..          | 0.47         | 1.60         | 0.44         |  |
| 15 Training of Gardeners .. ..                 | N. ..           | ..          | ..          | ..           | ..           | ..           |  |
| 16 Tobacco Research Scheme—                    | N. 0.40         | ..          | 0.09        | 0.06         | 0.11         | 0.09         |  |
| Meenapalayam Jaffna tobacco .. ..              | N. 0.74         | 0.02        | 0.05        | 0.06         | 0.04         | 0.05         |  |
| Kanyakumari district .. ..                     | N. ..           | ..          | ..          | 0.05         | 0.11         | 0.10         |  |
| <b>Total .. ..</b>                             | <b>N. 71.72</b> | <b>3.47</b> | <b>3.05</b> | <b>11.03</b> | <b>19.41</b> | <b>20.01</b> |  |

\* Scheme charged with local represents provision for Kanyakumari district.



APPENDIX No. 6—cont.  
Statement showing the Second Five-year Plan Schemes, targets and achievements—cont.

| Serial number and name of scheme.                                                                                                                   | Second Plan provision.<br>(2) | Expenditure (in lakhs). |                          |                                  |       | Budget estimate, 1959-60.<br>(6) | Anticipated actuals.<br>(7) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------|--------------------------|----------------------------------|-------|----------------------------------|-----------------------------|
|                                                                                                                                                     |                               | Actuals.                |                          |                                  | (5)   |                                  |                             |
|                                                                                                                                                     |                               | 1956-57,<br>(3)         | 1957-58,<br>(4)          | 1958-59.                         |       |                                  |                             |
| (1)                                                                                                                                                 |                               |                         |                          |                                  |       |                                  |                             |
| IV. Agricultural Education—                                                                                                                         |                               |                         |                          |                                  |       |                                  |                             |
| 1 Strengthening of Agricultural College ..                                                                                                          | N. 26.00                      | 0.86                    | 3.72                     | 9.20                             | 1.51  | 5.92                             |                             |
| 2 Scheme for upgrading the Agricultural College—<br>Statistical Section 'X' Ray unit .. }<br>Purchase of Technical books and Farm }<br>Equipment. } | N. 2.67                       | 0.03                    | 0.04                     | 0.03                             | 0.09  | 0.05                             |                             |
| 3 Scheme for upgrading Agricultural College<br>and Research Institute into a Post-Graduate<br>Institute.                                            | N. ..                         | ..                      | ..                       | 0.76                             | 20.90 | 9.69                             |                             |
| 4 Strengthening of Agriculture Department ..                                                                                                        | N. 13.00                      |                         |                          | (Scheme excluded from the plan.) |       |                                  |                             |
|                                                                                                                                                     | N. 41.67                      | 0.89                    | 3.76                     | 9.99                             | 22.50 | 15.66                            |                             |
| Total ..                                                                                                                                            |                               |                         |                          |                                  |       |                                  |                             |
| V. Agricultural Research, Information, etc.—                                                                                                        |                               |                         |                          |                                  |       |                                  |                             |
| 1 Agricultural Information .. .. .                                                                                                                  | N. 1.12                       | 0.02                    | 0.17                     | 0.44                             | 0.26  | 0.90                             |                             |
| 2 Betelvine Wilt .. .. .                                                                                                                            | N. 0.10                       | 0.02                    | 0.10                     | 0.07                             | 0.12  | 0.13                             |                             |
| 3 Gur Manufacture .. .. .                                                                                                                           | N. 0.54                       | ..                      | 0.03                     | 0.09                             | 0.39  | 0.30                             |                             |
| 4 Manual trials on Ryots fields<br>(a) Seed Testing Station .. .. .                                                                                 | N. ..<br>N. 2.63              | ..<br>..                | ..<br>(Scheme deferred.) | 0.02                             | 0.70  | 0.38                             |                             |
| 5 Sugarcane Research .. .. .                                                                                                                        | N. 5.71                       | 0.90                    | 1.23                     | 3.82                             | 7.78  | 2.44                             |                             |

|                                                                                                |           |          |          |          |          |          |  |
|------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|----------|----------|--|
| 6 Regional Research Fruit Station ..                                                           | N. ..     | ..       | 0.05     | 1.18     | 0.40     | 0.54     |  |
| 7 Banana Research Scheme ..                                                                    | N. ..     | 0.18     | 0.25     | 0.28     | 0.28     | 0.27     |  |
| 8 Model Agronomic Experiments at Agricultural<br>Research Station, Aduthurai and Bhavanisagar. | N. ..     | 0.09     | 0.15     | 0.12     | 0.16     | 0.15     |  |
|                                                                                                |           |          |          |          |          |          |  |
| Total ..                                                                                       | N. 10.10  | 1.21     | 1.98     | 6.02     | 10.03    | 5.11     |  |
| Minor Irrigation—                                                                              |           |          |          |          |          |          |  |
| Sinking of Tubewells and Artesian wells ..                                                     | N. 46.18  | ..       | ..       | ..       | ..       | ..       |  |
| Filter Point Scheme ..                                                                         | N. 47.50  | 14.58    | 11.37    | 9.67     | 11.13    | 6.72     |  |
| River Pumping ..                                                                               | N. 3.44   | 0.15     | 0.11     | 0.01     | 0.59     | 0.03     |  |
| Lift Irrigation (Hiring) ..                                                                    | N. ..     | 0.98     | 0.92     | (—) 0.21 | 0.48     | 0.59     |  |
| Lift Irrigation (Hire Purchase)                                                                | N. ..     | (—) 2.19 | (—) 8.73 | (—) 1.69 | (—) 7.26 | 3.87     |  |
|                                                                                                |           |          |          |          |          |          |  |
| Total ..                                                                                       | N. 97.12  | 13.52    | 3.67     | 7.78     | 4.92     | 11.21    |  |
| Land Development—                                                                              |           |          |          |          |          |          |  |
| Tractor Hiring Scheme ..                                                                       | N. 17.08  | 4.44     | 4.31     | 5.49     | 3.09     | 6.88     |  |
| Tractor Hire Purchase System ..                                                                | N. ..     | 7.11     | 1.37     | (—) 1.66 | (—) 4.50 | (—) 2.83 |  |
|                                                                                                |           |          |          |          |          |          |  |
| Total ..                                                                                       | N. 17.08  | 11.55    | 5.68     | 3.83     | (—) 1.41 | 4.05     |  |
|                                                                                                |           |          |          |          |          |          |  |
| Soil Conservation in Agricultural lands. ..                                                    | N. 100.20 | 10.56    | 17.77    | 15.45    | 20.35    | 17.87    |  |

## APPENDIX No. 7.

*List of agricultural schemes in progress in Madras State during 1959-60.*

| Serial number and name of the scheme.                                                                                                           | Place of working.                                        | Officer-in-charge.                                                      | Object of the scheme. |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|-----------------------|
| (1)                                                                                                                                             | (2)                                                      | (3)                                                                     | (4)                   |
| A. SCHEME FINANCED BY THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH.                                                                              |                                                          |                                                                         |                       |
| 1 Co-ordinated scheme for research on fungicides.                                                                                               | Agricultural College and Research Institute, Coimbatore. | Mycologist and Associate Professor, Plant Pathology.                    | As in column (1).     |
| 2 Scheme for research on the Toxicology and adverse effects of synthetic pesticides.                                                            | Coimbatore .. ..                                         | Entomologist and Associate Professor of Entomology.                     | Do.                   |
| 3 Scheme for investigation of betelvine wilt disease in the Madras State.                                                                       | Velur .. ..                                              | Mycologist and Associate Professor of Plant Pathology.                  | Do.                   |
| 4 Scheme for investigation into the methods and practices of farming in various States.                                                         | All over the State ..                                    | Agronomist and Associate Professor of Agronomy.                         | Do.                   |
| 5 Scheme for evolution of paddy strains suitable for inundated areas.                                                                           | Thalainayar .. ..                                        | Paddy Specialist, Coimbatore ..                                         | Do.                   |
| 6 Scheme for simple fertilizer trials on cultivators' fields.                                                                                   | All over the State—Nine places.                          | Agronomist and Associate Professor of Agronomy.                         | Do.                   |
| 7 Scheme for research on clove nutmeg and cocoa.                                                                                                | Kallar .. ..                                             | Horticulturist and Associate Professor of Horticulture.                 | Do.                   |
| 8 Co-ordinated scheme for the improvement of chillies.                                                                                          | Koipatti .. ..                                           | Millet and Pulses Specialist ..                                         | Do.                   |
| 9 Scheme for reclamation of saline and alkaline.                                                                                                | Coimbatore .. ..                                         | Agricultural Chemist and Associate Professor, Soil Science, Coimbatore. | Do.                   |
| 10 Scheme for studies on the revision of Phosphates in the laterite soil on the Nilgiris.                                                       | Do. .. ..                                                | Agricultural—Chemist and Associate Professor, Soil Science, Coimbatore. | Do.                   |
| 11 Scheme for intensification of research on mango citrus and grapes, Fruit Research Station, Periyakulam.                                      | Periyakulam .. ..                                        | Horticulturist, Periyakulam ..                                          | Do.                   |
| 12 Scheme for chemical investigation to of the cause of blast resistance in paddy.                                                              | Coimbatore .. ..                                         | Agronomist and Associate Professor of Agronomy.                         | Do.                   |
| 13 Scheme for the improvement of vegetables.                                                                                                    | Do. .. ..                                                | Horticulturist and Associate Professor of Horticulture.                 | Do.                   |
| 14 Scheme on cytogenetics of wild grasses and breeding them for selection of fodder of forage grasses.                                          | Do. .. ..                                                | Systematic Botanist and Associate Professor of Botany.                  | Do.                   |
| 15 Scheme on Cytogenetical Studies of grapes and their wild species.                                                                            | Do. .. ..                                                | Do. .. ..                                                               | Do.                   |
| 16 Scheme for the evolution of drought resistant strains of paddy.                                                                              | Do. .. ..                                                | Paddy Specialist, Coimbatore.                                           | Do.                   |
| 17 Scheme for taking up work on the nature of extent of uptakes of phosphates by leguminous green manure crops and their availability to paddy. | Do. .. ..                                                | Agronomist and Associate Professor of Agronomy.                         | Do.                   |
| 18 Scheme for breeding short-term rice strains possessing seed dormancy.                                                                        | Do. .. ..                                                | Paddy Specialist, Coimbatore ..                                         | Do.                   |
| 19 Scheme for research to improve and stabilise off seasons bearing in mango production.                                                        | Kanyakumari .. ..                                        | Horticulturist and Associate Professor of Horticulture.                 | Do.                   |
| 20 Scheme for research on stem borer and other pests of paddy.                                                                                  | Aduthurai .. ..                                          | Entomologist and Associate Professor of Entomology.                     | Do.                   |

## APPENDIX No. 7—cont.

## List of agricultural schemes in progress in Madras State during 1958-60—cont.

| Serial number and name of the scheme.<br>(1)                                                                                     | Place of working.<br>(2)           | Officer-in-charge.<br>(3)                                           | Object of the scheme.<br>(4)                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. SCHEME FINANCED BY THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH—cont.                                                          |                                    |                                                                     |                                                                                                                                                                                                                                                                                                                                                          |
| 21 Scheme for the establishment of a central Banana Research Station, Aduthurai.                                                 | Aduthurai                          | .. .. Horticulturist and Associate Professor of Horticulture.       | As in column (2).                                                                                                                                                                                                                                                                                                                                        |
| 22 Scheme for the study of nitrogen fixing blue and green algae in rice soils.                                                   | Coimbatore                         | .. .. Mycologist and Associate Professor of Plant Pathology.        | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 23 Scheme for research on and improvement of legumes and other fodders.                                                          | Do.                                | .. .. Systematic Botanist and Associate Professor of Botany.        | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 24 Scheme for the investigation on stem rot disease of rice in Madras State.                                                     | Aduthurai                          | .. .. Mycologist and Associate Professor of Plant Pathology.        | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 25 Scheme for the evolution of new varieties of Dolichos lab. lab.                                                               | Coimbatore                         | .. .. Millet and Pulses Specialist                                  | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 26 Pilot scheme for Agronomic Research in the Black Soil regime of South India.                                                  | Tirunelveli                        | .. .. Assistant Agronomist                                          | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 27 Scheme for model Agronomic experiments.                                                                                       | Aduthurai and Bhavani-sagar.       | Agronomist and Associate Professor of Agronomy.                     | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 28 Scheme for evolving the breeding of pircularia resistant strains of paddy of different durations.                             | Coimbatore Aduthurai.              | and Paddy Specialist, Coimbatore                                    | Do                                                                                                                                                                                                                                                                                                                                                       |
| 29 Scheme for evolution of superior saline and alkaline resistance of strains.                                                   | Peravaruni                         | .. .. Do.                                                           | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 30 Scheme for the development of fruit production.                                                                               | In all the districts of the State. | Assistant Horticulturist Fruit Development Scheme, Coimbatore.      | The scheme envisages the extension of area under fruits cultivation and improvement of existing orchards to increase fruit production by issue of long and short term loans to fruit growers and rendering free technical guidance to them on problems of fruit cultivation. The annual targets are 700 acres for the former 3,000 acres for the latter. |
| 31 Scheme for the grant of loans for small-scale fruit preservation units.                                                       | Through on the State               | Horticulturist and Associate Professor of Horticulture, Coimbatore. | A sum of Rs. 50,000 is to be distributed as loans to private parties for starting small-scale fruit and vegetable preservation units and for renovating the existing units also. The scheme has not been implemented so far as the detailed working procedure has not yet been finalised and approved by Government.                                     |
| B. SCHEME FINANCED BY THE INDIAN CENTRAL COTTON COMMITTEE.                                                                       |                                    |                                                                     |                                                                                                                                                                                                                                                                                                                                                          |
| 1 Scheme for breeding an early variety of cotton suitable for cultivation as an off seasonal crop in the rice fallows of Madras. | Palur, Aduthurai and Coimbatore.   | and Assistant Cotton Specialist                                     | .. Since closed on 31st October 1959.                                                                                                                                                                                                                                                                                                                    |
| 2 Scheme for improvement of Tinnevelles and Karunganni cotton in Madras State.                                                   | Koilkatti, Coimbatore              | Do.                                                                 | As in column (2).                                                                                                                                                                                                                                                                                                                                        |
| 3 Scheme for the production of extra long staple cotton of 1-3/16" in Madras State.                                              | Srivilliputhur                     | Do.                                                                 | Do.                                                                                                                                                                                                                                                                                                                                                      |
| 4 Scheme for breeding unirrigated cambodia cotton of 1-3/16" in Madras State.                                                    | Periakulam                         | Do.                                                                 | Do.                                                                                                                                                                                                                                                                                                                                                      |

## APPENDIX No. 7—cont.

## List of agricultural schemes in progress in Madras State during 1959-60—cont.

| Serial number and name of the scheme.                                                                          | Place of working. | Officer-in-charge.                                         | Object of the scheme.                                                                                                      |
|----------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| (1)                                                                                                            | (2)               | (3)                                                        | (4)                                                                                                                        |
| C. SCHEME FINANCED BY THE INDIAN CENTRAL OILSEEDS COMMITTEE.                                                   |                   |                                                            |                                                                                                                            |
| 1 Scheme for the research on storage of seeds oils and cakes of groundnut.                                     | Coimbatore .. ..  | Assistant Agricultural Chemist ..                          | As in column (2).                                                                                                          |
| 2 Scheme for the intensive breeding of groundnut in Madras State.                                              | Tindivanam .. ..  | Superintendent, Agricultural Research Station, Tindivanam. | Do.                                                                                                                        |
| 3 Scheme for research on physiology of groundnuts in Madras State.                                             | Coimbatore .. ..  | Groundnut Physiologist .. ..                               | Do.                                                                                                                        |
| 4 Scheme for fundamental research on cytology of groundnut in Madras State.                                    | Do. .. ..         | Cytogeneticist .. ..                                       | Do.                                                                                                                        |
| 5 Scheme for studies of physical and chemical criteria of gur leading to the formation of basic of gur grades. | Cuddalore .. ..   | Sugarcane Specialist, Cuddalore.                           | Do.                                                                                                                        |
| 6 Scheme for establishment of a groundnut Research Experimental Station in Pollachi tract.                     | Pollachi .. ..    | Assistant Oilseeds Specialist, Pollachi.                   | Do.                                                                                                                        |
| 7 Scheme for the intensive breeding of sesamum.                                                                | Karur .. ..       | Assistant Oilseeds Specialist ..                           | Do.                                                                                                                        |
| 8 Scheme for carrying out effective plant protection measures on oil seeds crops in Madras State.              | Pollachi .. ..    | District Agricultural Officer, Coimbatore.                 | In order to prevent serious damage caused by Pests and Diseases and to oil seed crops and thus attainment of State Target. |

9 Scheme for the Co-ordinated Manurial trials on groundnut.

South Arcot district, Coimbatore, Tiruchirappalli, Salem Ramana-thaparam.

Oilseeds Specialist

To find out the manurial requirements of the summer crops raised under irrigated with important irrigated areas of the State. To determine the manurial requirements of the monsoon Kariff crop grown in the main producing areas so that fertiliser doses for general adoption might be recommended for each tract. To fix the optimum doses and confirmation of nitrogen, phosphoric acid and potash required for the crop in the different groundnut growing regions and to enable the department to recommend an effective and economic combination of fertilisers for the crop.

## D. SCHEME FINANCED BY THE INDIAN CENTRAL TOBACCO COMMITTEE.

1 Scheme for the improvement of Meenampalayam Tobacco in Coimbatore district.

Bhavanisagar .. .. Superintendent Agricultural Research Station, Bhavanisagar.

As in column (2).

## E. SCHEMES FINANCED BY THE INDIAN CENTRAL SUGARCANE COMMITTEE.

1 Scheme for the improvement of gur manufacture and storage.

Gudiyatham .. .. Sugarcane Specialist Cuddalore ..

As in column (2).

2 Sugarcane Insect Pests Scheme.

Coimbatore .. .. Assistant Entomologist .. ..

Do.

3 Scheme for establishment of a Sugarcane Research Sub-station at Tiruchirappalli.

Kulitalai .. .. Assistant Agronomist .. ..

Do.

4 Scheme for the establishment of a sugarcane Research sub-station at Gudiyatham.

Gudiyatham .. .. Sugarcane Specialist, Cuddalore ..

Do.

5 Soil Survey on Sugarcane crop and classification of dry soils contiguous to the cane tracts.

Coimbatore .. .. Soil Survey Officer .. ..

Do.

## APPENDIX No. 7—cont.

## List of agricultural schemes in progress in Madras State during 1959-60—cont.

| Serial number and name of the scheme.                                                                   | Place of working. | Officer-in-charge.                       | Object of the scheme. |
|---------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------|-----------------------|
| (1)                                                                                                     | (2)               | (3)                                      | (4)                   |
| E. SCHEMES FINANCED BY THE INDIAN CENTRAL SUGARCANE COMMITTEE—cont.                                     |                   |                                          |                       |
| 6 Scheme for the establishment of a full fledged Sugarcane Research Station at Nellikuppam (Cuddalore). | Cuddalore         | .. .. Sugarcane Specialist, Cuddalore .. | As in column (2).     |
| 7 Establishment of a Meteorological observatory at Sugarcane Research Station, Cuddalore.               | Do.               | .. .. Sugarcane Specialist, Cuddalore .. | Do.                   |

## F. SCHEMES FINANCED BY INDIAN CENTRAL COCONUT COMMITTEE.

|                                                                                              |                                                               |                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Scheme for the establishment of a Regional Coconut Research Station in Thanjavur district. | Veppankulam                                                   | .. .. Assistant Oilseeds Specialist, Pattukkottai.                                                                                            | As in column (2)                                                                                                                                                                                                                                                                                                                                                                                      |
| 2 Scheme for the establishment of parasite breeding centres.                                 | Nagercoil, Gudiyatham, Pattukkottai, Udangudi and Coimbatore. | District Agricultural Officers, Nagercoil, Vellore, Pattukkottai, Tirunelveli and Crop and Plant Protection Officer (Entomology), Coimbatore. | 1. Multiplying parasites (Bethyids and Eulopides) in the laboratory.<br>2. Releasing parasites in the pest-affected areas surveying the areas for pest and parasite population, carrying on propaganda for releasing parasites in all the affected coconut gardens and exploring the possibilities of finding out new parasites and predators other alternative for pests breeding in the laboratory. |

## G. SCHEMES FINANCED BY THE STATE GOVERNMENT.

|                                                                                                                                                                                        |                                                                                 |                                                                  |                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Scheme for soil testing laboratory at Coimbatore.                                                                                                                                    | Coimbatore                                                                      | .. .. Assistant Soil Chemist ..                                  | To give advice to the fertilizer application based on soil tests and also to collect data, which will be utilised for obtaining fundamental information on the fertility status of the soil and allied problems.<br>To secure inventory of the soils with reference to their potential capacity for crop production. |
| 2 Scheme for reconnaissance of soil survey in the ayacut area of the Parambikulam Upper Aliyar project.                                                                                | Do.                                                                             | .. .. Assistant Agricultural Chemist ..                          | As in column (2).                                                                                                                                                                                                                                                                                                    |
| 3 Scheme for rapid multiplication and distribution of hybridumbu seeds.                                                                                                                | Sathyamangalam                                                                  | .. .. Millet and Pulses Specialist ..                            | As in column (2).                                                                                                                                                                                                                                                                                                    |
| 4 Scheme for soil survey work in Amaravathy project ayacut area.                                                                                                                       | Coimbatore                                                                      | .. .. Soil Survey Officer, Coimbatore ..                         | To find out the suitability of soils for irrigation, and where the soils are likely to deteriorate on irrigation to recommend measures to prevent the deterioration.<br>With a view to provide facilities for educating local ryots in modern farming.                                                               |
| 5 Scheme for opening of experimental farm at Ponneri at Chingleput district.                                                                                                           | Anuppambattu village, Ponneri taluk.                                            | Farm Assistant, Anuppambattu.                                    | For raising the status of Agricultural Research Station, Pattukkottai, with a Gazetted Officer in-charge of the Station with certain increased staff over and above the existing staff now working in the station.                                                                                                   |
| 6 Scheme for raising up the status of Agricultural Research Station, Pattukkottai.                                                                                                     | Agricultural Research Station, Pattukkottai.                                    | Superintendent, Agricultural Research Station, Pattukkottai.     | To educate the young farmers in all round practical training in Agriculture and allied sciences including Animal Husbandry, dairying, vegetable cultivation, plant production, etc.                                                                                                                                  |
| 7 Scheme for refresher course in Agriculture for young farmers.                                                                                                                        | Agricultural College and Research Institute, Coimbatore.                        | Superintendent, Central Farm, Coimbatore.                        | To establish four Model orchards—cum Nurseries at different centres in the State to visually demonstrate to growers fruit growing on scientific lines improved practices and varieties and to make available to the public fruit plants of improved types.                                                           |
| 8 Scheme for the establishment of model orchards—cum—nurseries one each at Kodaikanal, Kuttalam and one for Thanjavur, Tiruchirappalli and another for North Arcot, Chingleput region. | Kodaikanal, Kuttalam (Thanjavur, Tiruchirappalli) and (Chingleput) South Arcot. | Assistant Horticulturist (Fruit Development Scheme, Coimbatore). |                                                                                                                                                                                                                                                                                                                      |

## APPENDIX No. 7—cont.

## List of agricultural schemes in progress in Madras State during 1959-60—cont.

| Serial number and name of the scheme.                                                                     | Place of working.                                                                                                                      | Officer-in-charge.                                                          | Object of the scheme.                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                                                                                                       | (2)                                                                                                                                    | (3)                                                                         | (4)                                                                                                                                                                                                                                                                        |
| G. SCHEMES FINANCED BY THE STATE GOVERNMENT—cont.                                                         |                                                                                                                                        |                                                                             |                                                                                                                                                                                                                                                                            |
| 9 Extension of the scheme for establishment of model orchards at Periyakulam and Thimmapuram.             | Thimmapuram, Kaveri-<br>patnam Post Office,<br>Periyakulam.                                                                            | Assistant Horticulturist,<br>Development Scheme, Coimbatore.                | The object of the scheme is the same as above.                                                                                                                                                                                                                             |
| 10 Scheme for the appointment of Extension Assistants at the model orchards, Thimmapuram and Periyakulam. | Do.                                                                                                                                    | Do.                                                                         | To make available to growers the services of the Extension Assistants who are to visit the private orchards, meet growers and render them all technical assistance and advice and popularise improved and new kinds and varieties of fruits and other horticultural crops. |
| 11 Scheme for conducting State level competition in Banana.                                               | Throughout the State                                                                                                                   | Banana Research Officer, Aduthurai.                                         | The scheme envisages the award of cash prizes to Banana growers in whose holding the Banana are established well and maintained in a well manner.                                                                                                                          |
| 12 Superior cotton certification scheme.                                                                  | Chingleput, Coimbatore,<br>Madurai, North Arcot,<br>Ramanathapuram, Salem, South Arcot,<br>Thanjavur, Tiruchirappalli and Tirunelveli. | Superior Cotton Certification Officer, Rajapalayam.                         | To issue certificates certifying the quantity and standard of staple length for MCU. 1, MCU. 2 and 9030 G cottons so as to enable them to get higher prices in the market to the benefit of the cotton growing and the trader.                                             |
| 13 Scheme for multiplied and distribution of P. 216F seeds in Madras State.                               | Tiruchirappalli district..                                                                                                             | Sri M. G. Narayanan, B.Sc. Ag.,<br>Cotton Extension Officer,<br>Coimbatore. | Multiplication and distribution of P. 216 F seeds in Madras State.                                                                                                                                                                                                         |

## H. SCHEME FINANCED BY THE GOVERNMENT OF INDIA.

- 1 Oilseeds Development Scheme All districts except Oilseeds Development Officer, To achieve an additional production of oilseeds of 97,500 tons by the end of the Second Five-Year Plan period.

## I. SCHEMES FINANCED BY STATE GOVERNMENT AND GOVERNMENT OF INDIA.

- 1 Scheme for establishment of an Agricultural College and Extension Wing at Agricultural Research Institute, Coimbatore. The object of the scheme is to bring together the research workers and the extension worker and it will have important functions in all the three spheres of Agricultural activities, viz., education research and extension and also to provide scientific and supervised field training in extension methods and techniques and in short equipping the student with a better knowledge of extension work at the college so that he may be able to help the progressive ryot in a more scientific way.
- 2 Scheme for opening a Regional Post-Graduate Training Centre at Agricultural College and Research Institute, Coimbatore. For development of the Agricultural College into a strong centre of Post-Graduate education on a regional basis for imparting training in appropriate fields, leading to M.Sc., Ph.D. degrees on the lines of facilities available in some of reputed Post-Graduate Institutions in the Western countries.
- 3 Scheme for strengthening of Agricultural College and Research Institute, Coimbatore. To meet additional requirements of trained Agricultural personnel for various schemes included in Five-Year Plan schemes.
- 4 Comprehensive Coconut Nursery scheme. All districts except Nilgiris. Assistant Oilseeds Specialist, Pattukkottai. To produce and supply to the Coconut growers with selected seedlings on a large scale at a reasonable price by starting Coconut nursery in the important coconut growing tracks of this State.

## APPENDIX No. 7—cont.

## List of agriculture schemes in progress in Madras State during 1959-60—cont.

| Serial number and name of the scheme.                                                                                      | Place of working.             | Officer-in-charge.                           | Object of the scheme.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                                                                                                                        | (2)                           | (3)                                          | (4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| I. SCHEMES FINANCED BY STATE GOVERNMENT AND GOVERNMENT OF INDIA—cont.                                                      |                               |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5 Scheme for increasing production of coconut oil by intensive propagation.                                                | All districts except Nilgiris | Assistant Oilseeds Specialist, Pattukottai.  | To step up the production of Coconuts in the State by inducing the coconut growers to bring in new areas under coconut, wherever such possibilities exist and increasing the yield of the existing plantations by intensifying improved cultivation practices recommended by this Department.                                                                                                                                                                                                                                                                                                    |
| 6 Scheme for the establishment of four demonstration Coconut plantations in the Kozhuvelli swamp area in Tindivanam taluk. | South Arcot district          | Do.                                          | To demonstrate to the agriculturists living in the villages round about the swamp area the proper method of reclamation of the area and establishing coconut plantations there.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 7 Scheme for the Development of coconut cultivation in the coastal areas of Ramanathapuram district.                       | Ramanathapuram district.      | Coconut Development Officer, Ramanathapuram. | Given adequate facilities, the landless poor of the locality and also a few of the repatriates from Ceylon who are already plantation workers can be easily induced to settle down on such lands to establish good coconut plantations under the guidance and supervision of Government agencies. This measure it is expected would not only help the State in augmenting coconut production but also help to improve the economic condition of the landless poor inhabitants of this district and also in small measure, in helping the repatriates from Ceylon to settle down in this country. |

## J. SCHEME FINANCED BY STATE GOVERNMENT AND THE INDIAN CENTRAL OILSEEDS COMMITTEE.

|                                                                         |                                                           |                              |                                                                                                                                            |
|-------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Scheme for organizing crop yield competition on groundnut.            | Important districts where groundnut is grown largely,     | Oilseeds Development Officer | To make ryots to adopt modern methods and cultivate on scientific lines advocated by the Department to bring 15,000 acres under groundnut. |
| 2 Oilseeds Extension Scheme                                             | Important project areas in the States                     | Do.                          | To achieve an additional production of 36,000 tons.                                                                                        |
| 3 Scheme for running zonal nucleus seed farms for groundnut and castor. | Pollachi, Srivilliputtur, Tindivanam and Chittoor landur. | Do.                          | To produce and supply improved strains of nucleus seeds of groundnut and castor.                                                           |

## APPENDIX No. 8.

Particulars of work done in the Community Development and National Extension Service blocks during the fashi year 1969 (from 1st July 1959 to 30th June 1960).

| Names of the district.     | Improved paddy seeds distributed |       |                    |        | Improved millet distributed. |     |                    |       | Fertilisers distributed. | Compost prepared. | Area covered by Japanese method of cultivation. |          |       |           |     |
|----------------------------|----------------------------------|-------|--------------------|--------|------------------------------|-----|--------------------|-------|--------------------------|-------------------|-------------------------------------------------|----------|-------|-----------|-----|
|                            | Primary seed farm.               |       | Village seed farm. |        | Primary seed farm.           |     | Village seed farm. |       |                          |                   | T.                                              | LB.      | A.    | C.        |     |
|                            | (2)                              | LB.   | T.                 | LB.    | (4)                          | LB. | T.                 | LB.   |                          |                   |                                                 |          |       |           | (6) |
| (1)                        |                                  |       |                    |        |                              |     |                    |       |                          |                   |                                                 |          |       |           |     |
| 1 Guindy ..                | ..                               | 128   | 00                 | 1,538  | 00                           | 8   | 1,602              | 29    | 1,160                    | 1,526             | 00                                              | 28,798   | 00    | 35,490    | 00  |
| 2 Chingleput ..            | ..                               | 51    | 317                | 1,394  | 178                          | 1   | 580                | 12    | 45                       | 3,159             | 1,036                                           | 33,500   | 00    | 86,098    | 30  |
| 3 Polur ..                 | ..                               | 51    | 666                | 610    | 2,209                        | 1   | 392                | 10    | 348                      | 2,739             | 1,366                                           | 73,164   | 00    | 24,213    | 93  |
| 4 Vellore ..               | ..                               | 46    | 219                | 739    | 1,017                        | 5   | 976                | 60    | 1,873                    | 1,244             | 00                                              | 27,937   | 00    | 66,611    | 00  |
| 5 Cuddalore ..             | ..                               | 58    | 656                | 220    | 1,055                        | 2   | 1,305              | 5     | 382                      | 1,186             | 90                                              | 12,647   | 1,600 | 7,617     | 78  |
| 6 Villupuram ..            | ..                               | 49    | 1,392              | 447    | 1,684                        | 2   | 638                | 33    | 448                      | 2,454             | 430                                             | 20,918   | 00    | 33,507    | 00  |
| 7 Salem ..                 | ..                               | 31    | 119                | 270    | 913                          | 7   | 758                | 35    | 2,035                    | 998               | 00                                              | 24,904   | 00    | 23,170    | 00  |
| 8 Krishnagiri ..           | ..                               | 34    | 628                | 369    | 675                          | 19  | 1,166              | 165   | 1,501                    | 995               | 800                                             | 40,018   | 00    | 1,67,117  | 00  |
| 9 Thanjavur ..             | ..                               | 31    | 1,172              | 319    | 1,236                        | ..  | ..                 | ..    | ..                       | 2,141             | 00                                              | 2,909    | 00    | 33,808    | 00  |
| 10 Pattukkottai ..         | ..                               | 184   | 830                | 1,921  | 76                           | ..  | ..                 | ..    | ..                       | 5,391             | 00                                              | 29,041   | 00    | 1,01,440  | 00  |
| 11 Mayuram ..              | ..                               | 176   | 567                | 1,388  | 876                          | ..  | ..                 | ..    | ..                       | 2,386             | 440                                             | 2,899    | 00    | 1,01,223  | 35  |
| 12 Kumbakonam ..           | ..                               | 141   | 1,502              | 1,290  | 2,045                        | ..  | ..                 | ..    | ..                       | 6,062             | 667                                             | 12,932   | 00    | 1,08,179  | 00  |
| 13 Tiruchirappalli (North) | ..                               | 90    | 528                | 785    | 1,146                        | 29  | 976                | 50    | 83                       | 7,370             | 865                                             | 1,17,580 | 00    | 77,347    | 15  |
| 14 Tiruchirappalli (South) | ..                               | 29    | 1,935              | 441    | 1,106                        | 2   | 35                 | 11    | 1,124                    | 2,621             | 751                                             | 10,182   | 1,440 | 22,348    | 00  |
| 15 Madurai ..              | ..                               | 111   | 494                | 912    | 1,830                        | 33  | 2,223              | 181   | 1,223                    | 4,249             | 1,880                                           | 17,001   | 00    | 72,810    | 00  |
| 16 Dindigul ..             | ..                               | 17    | 1,603              | 313    | 906                          | 3   | 1,299              | 26    | 1,594                    | 3,566             | 1,604                                           | 45,929   | 00    | 56,746    | 50  |
| 17 Sattur ..               | ..                               | 26    | 844                | 471    | 0005                         | 0   | 1,331              | 49    | 2,084                    | 4,406             | 1,660                                           | 51,389   | 00    | 17,469    | 00  |
| 18 Sivaganga ..            | ..                               | 59    | 207                | 250    | 931                          | 0   | 1,422              | 4     | 1,923                    | 1,110             | 00                                              | 43,134   | 00    | 6,298     | 85  |
| 19 Tirunelveli ..          | ..                               | 52    | 714                | 316    | 1,411                        | 2   | 1,348              | 9     | 2,005                    | 2,063             | 1,565                                           | 31,267   | 429   | 24,480    | 17  |
| 20 Sankarankoil ..         | ..                               | 71    | 639                | 693    | 00                           | 5   | 372                | 62    | 00                       | 9,533             | 00                                              | 18,031   | 00    | 47,315    | 00  |
| 21 Erode ..                | ..                               | 65    | 1,287              | 481    | 2,035                        | 14  | 735                | 204   | 54                       | ..                | ..                                              | 35,900   | 00    | 37,698    | 00  |
| 22 Coimbatore ..           | ..                               | 22    | 586                | 71     | 635                          | 27  | 1,433              | 110   | 621                      | 4,167             | 1,253                                           | 13,744   | 00    | 32,868    | 00  |
| 23 Ootacamund ..           | ..                               | 0     | 1,000              | 22     | 1,795                        | ..  | ..                 | ..    | ..                       | ..                | ..                                              | 18,640   | 00    | 773       | 00  |
| 24 Nagercoil ..            | ..                               | 34    | 1,621              | 283    | 1,587                        | ..  | ..                 | ..    | ..                       | 2,469             | 1,659                                           | 45,157   | 1,910 | 11,777    | 91  |
| Total ..                   | ..                               | 1,564 | 1,605              | 15,544 | 1,341                        | 168 | 671                | 1,063 | 583                      | 71,842            | 386                                             | 7,59,311 | 999   | 11,96,406 | 94  |



## APPENDIX No. 8—cont.

*Particulars of work done in the Community Development and National Extension Service Block during the fiscal year 1969 (from 1st July to 30th June 1960)—cont.*

| Name of the district.       | Area covered with plant protection measures. |            | Improved implements distributed. | Demonstration unit out. | Coconut seedlings distributed. | Fruit plants distributed. | Quantity of green manure distributed. |
|-----------------------------|----------------------------------------------|------------|----------------------------------|-------------------------|--------------------------------|---------------------------|---------------------------------------|
|                             | (1)                                          | (2)        | (3)                              | (4)                     | (5)                            | (6)                       | (7)                                   |
|                             |                                              | A. C.      | NOS.                             | NOS.                    | NOS.                           | NOS.                      | T. LB.                                |
| 1 Guindy .. ..              | ..                                           | 178,185 00 | 2,012                            | 3,426                   | 33,279                         | 13,538                    | 159 1164                              |
| 2 Chingleput .. ..          | ..                                           | 31,738 00  | 3,807                            | 3,554                   | 1,160                          | 7,189                     | 44 252                                |
| 3 Polur .. ..               | ..                                           | 13,835 42  | 1,402                            | 834                     | 7,916                          | 38,192                    | 46 1020                               |
| 4 Vellore .. ..             | ..                                           | 5,794 60   | 1,370                            | 599                     | 2,165                          | 713,888                   | 33 1564                               |
| 5 Cuddalore .. ..           | ..                                           | 9,951 00   | 737                              | 490                     | 2,235                          | 7,429                     | 27 1460                               |
| 6 Villupuram .. ..          | ..                                           | 29,160 00  | 1,255                            | 427                     | 6,150                          | 5,308                     | 20 514                                |
| 7 Salem .. ..               | ..                                           | 10,028 00  | 310                              | 1,885                   | 13,371                         | 17,167                    | 8 2013                                |
| 8 Krishnagiri .. ..         | ..                                           | 12,323 00  | 18,101                           | 6,012                   | 12,704                         | 70,278                    | 8 1139                                |
| 9 Thanjavur .. ..           | ..                                           | 8,312 00   | 284                              | 1,798                   | 12,866                         | 15,636                    | 59 1386                               |
| 10 Pattukkottai .. ..       | ..                                           | 20,782 00  | 3,454                            | 1,022                   | 26,421                         | 60,582                    | 131 00                                |
| 11 Mayuram .. ..            | ..                                           | 21,377 00  | 1,630                            | 1,135                   | 4,890                          | 12,935                    | 87 1407                               |
| 12 Kumbakonam .. ..         | ..                                           | 24,498 80  | 2,346                            | 1,485                   | 11,749                         | 13,848                    | 229 994                               |
| 13 Tiruchirappalli (North). | ..                                           | 160,000 00 | 2,042                            | 5,208                   | 6,098                          | 47,578                    | 81 643                                |
| 14 Tiruchirappalli (South). | ..                                           | 21,713 20  | 388                              | 1,672                   | 2,734                          | 5,118                     | 12 1827                               |
| 15 Madurai .. ..            | ..                                           | 32,400 00  | 1,823                            | 1,666                   | 10,035                         | 48,065                    | 71 1760                               |
| 16 Dindigul .. ..           | ..                                           | 67,496 30  | 1,037                            | 6,313                   | 9,039                          | 470,958                   | 84 114                                |
| 17 Sattur .. ..             | ..                                           | 66,733 00  | 1,037                            | 12,026                  | 6,689                          | 50,132                    | 12 2189                               |
| 18 Sivaganga .. ..          | ..                                           | 11,259 66  | 1,315                            | 511                     | 8,953                          | 11,045                    | 34 1789                               |
| 19 Tirunelveli .. ..        | ..                                           | 14,769 95  | 172                              | 730                     | 2,759                          | 23,186                    | 18 200                                |
| 20 Sankarankoil .. ..       | ..                                           | 6,293 00   | 1,035                            | 3,106                   | 6,177                          | 14,912                    | 29 674                                |
| 21 Erode .. ..              | ..                                           | 1,028 00   | 1,127                            | 376                     | 8,843                          | 23,114                    | 137 495                               |
| 22 Coimbatore .. ..         | ..                                           | 51,835 00  | 1,490                            | 5,772                   | 10,184                         | 41,565                    | 21 121                                |
| 23 Ootacamund .. ..         | ..                                           | 6,679 00   | 13                               | 367                     | ..                             | 20,654                    | 21 2001                               |
| 24 Nagercoil .. ..          | ..                                           | 9,867 18   | 347                              | 5,220                   | 23,957                         | 66,801                    | 6 2023                                |
| Total .. ..                 | ..                                           | 836,058 60 | 49,994                           | 65,436                  | 230,375                        | 1,119,170                 | 1,192 669                             |

## APPENDIX No. 9.

*Names of State Seed Farms existing on 1st July 1960.*

| <i>Serial number and District<br/>Agricultural Officer.</i> | <i>Name of the<br/>State Seed Farm.</i> | <i>Number of<br/>farms.</i> |
|-------------------------------------------------------------|-----------------------------------------|-----------------------------|
| (1)                                                         | (2)                                     | (3)                         |
| 1 Chingleput .. ..                                          | Sirukaveripakkam .. ..                  | 2                           |
|                                                             | Modaiyur .. ..                          | 2                           |
| 2 Guindy .. ..                                              | Kolandalore .. ..                       | 2                           |
|                                                             | Uthukottai .. ..                        | 1                           |
| 3 Polur .. ..                                               | Athiyandal .. ..                        | 2                           |
|                                                             | Marudadu .. ..                          | 2                           |
|                                                             | Kilnarma .. ..                          | 2                           |
|                                                             | Vazhavachanur .. ..                     | 8                           |
| 4 Villupuram .. ..                                          | Vanur .. ..                             | 2                           |
|                                                             | Kakuppam .. ..                          | 2                           |
| 5 Cuddalore .. ..                                           | Vandrayampatti .. ..                    | 2                           |
|                                                             | Sethiathope .. ..                       | 2                           |
|                                                             | Vellappakkam .. ..                      | 3                           |
|                                                             | Vadakkamandal .. ..                     | 2                           |
|                                                             | Neyveli .. ..                           | 2                           |
| 6 Kumbakonam .. ..                                          | Sakkottai .. ..                         | 1                           |
|                                                             | Maruthanallur .. ..                     | 1                           |
| 7 Thanjavur .. ..                                           | Kanchikudikadu .. ..                    | 2                           |
|                                                             | Orthaur .. ..                           | 2                           |
| 8 Pattukkottai Division ..                                  | Keeranthi .. ..                         | 2                           |
|                                                             | Deevambalpattinam .. ..                 | 2                           |
|                                                             | Needumbalam .. ..                       | 2                           |
|                                                             | Veppankulam .. ..                       | 2                           |
|                                                             | Namasivayapuram .. ..                   | 2                           |
| 9 Mayuram Division ..                                       | Nagamangalam .. ..                      | 2                           |
|                                                             | Thirukodayur .. ..                      | 2                           |
|                                                             | Kondathur .. ..                         | 2                           |
|                                                             | Mahadanapuram .. ..                     | 2                           |
| 10 Tiruchirappalli (South).                                 | Thiravarangulam .. ..                   | 2                           |
|                                                             | Thirakampuliyur .. ..                   | 1                           |
|                                                             | Mekkudy .. ..                           | 3                           |
| 11 Tiruchirappalli (North).                                 | Marudur .. ..                           | 1                           |
| 12 Madurai .. ..                                            | Kappalur .. ..                          | 2                           |
| 13 Dindigul .. ..                                           | Ayyalur .. ..                           | 2                           |
|                                                             | Vilpatti .. ..                          | 2                           |
| 14 Sattur .. ..                                             | Devadanam .. ..                         | 2                           |
|                                                             | Pallur .. ..                            | 2                           |
| 15 Sivaganga .. ..                                          | Udayachi .. ..                          | 8                           |
|                                                             | Muraiyur .. ..                          | 2                           |
| 16 Tirunelveli .. ..                                        | Kariaiyiruppu .. ..                     | 3                           |

## APPENDIX No. 9—cont.

*Names of State Seed Farms existing on 1st July 1960—cont.*

| <i>Serial number and District<br/>Agricultural Officer.</i> | <i>Name of the state<br/>seed farm.</i> | <i>Name of<br/>farms.</i> |
|-------------------------------------------------------------|-----------------------------------------|---------------------------|
| (1)                                                         | (2)                                     | (3)                       |
| 17 Nagercoil .. ..                                          | Tirupathisaram .. ..                    | 2                         |
| 18 Salem .. ..                                              | Mulluvadi .. ..                         | 2                         |
| 19 Krishnagiri .. ..                                        | Danishpet .. ..                         | 4                         |
|                                                             | Nachinampatti .. ..                     | 2                         |
|                                                             | Paprapatti .. ..                        | 2                         |
| 20 Coimbatore .. ..                                         | Pongalur .. ..                          | 1                         |
|                                                             | Kannampalayam .. ..                     | 2                         |
|                                                             | Veerakeralam .. ..                      | 2                         |
| 21 Erode .. ..                                              | Bhavani .. ..                           | 1                         |
|                                                             | Bavanisagar .. ..                       | 2                         |
|                                                             | Satyamangalan .. ..                     | 4                         |
| 22 Nilgiris District ..                                     | Vijayanagar .. ..                       | 2                         |
|                                                             | Kurthukuly .. ..                        | 3                         |
|                                                             | Kakathope .. ..                         | 1                         |
|                                                             | Baroda Palace .. ..                     | 2                         |
|                                                             | Thumanatty .. ..                        | 1                         |
|                                                             | Doddaberta .. ..                        | 1                         |
|                                                             | Colgrain .. ..                          | 2                         |
|                                                             | Killar .. ..                            | 2                         |
| Grand total .. ..                                           |                                         | 127                       |

## APPENDIX NO. 10.

Quantity of seeds brought to stocks from 1st July 1959 to 30th June 1960 in the State Seed Farm.

| Serial number and name of the district. | (1) |     | (2) |       | (3) |       | (4) |     | (5) |     | (6) |       | (7) |       |
|-----------------------------------------|-----|-----|-----|-------|-----|-------|-----|-----|-----|-----|-----|-------|-----|-------|
|                                         | T.  | LB. | T.  | LB.   | T.  | LB.   | T.  | LB. | T.  | LB. | T.  | LB.   | T.  | LB.   |
| 1 Chingleput                            | ..  | ..  | 148 | 1,916 | ..  | ..    | 6   | 493 | ..  | ..  | 16  | 390   | 0   | 1,786 |
| 2 North Arcot                           | ..  | ..  | 38  | 1,193 | 0   | 45    | 11  | 408 | ..  | ..  | 1   | 1,302 | ..  | ..    |
| 3 South Arcot                           | ..  | ..  | 257 | 1,292 | ..  | ..    | 10  | 46  | ..  | ..  | 7   | 463   | 3   | 1,550 |
| 4 Thanjavur                             | ..  | ..  | 585 | 1,474 | ..  | ..    | ..  | ..  | ..  | ..  | 4   | 1,785 | 0   | 1,116 |
| 5 Tiruchirappalli                       | ..  | ..  | 55  | 579   | 1   | 1,520 | 1   | 570 | ..  | ..  | 6   | 1,998 | 7   | 1,123 |
| 6 Madurai                               | ..  | ..  | 4   | 1,839 | 0   | 560   | 1   | 346 | ..  | ..  | 14  | 278   | ..  | ..    |
| 7 Ramanathapuram                        | ..  | ..  | 71  | 561   | 2   | 2,192 | 1   | 108 | ..  | ..  | ..  | ..    | ..  | ..    |
| 8 Tirunelveli                           | ..  | ..  | 262 | 759   | ..  | ..    | ..  | ..  | ..  | ..  | ..  | ..    | ..  | ..    |
| 9 Kanyakumari                           | ..  | ..  | 51  | 1,808 | ..  | ..    | ..  | ..  | ..  | ..  | 6   | 210   | 3   | 2,225 |
| 10 Salem                                | ..  | ..  | 43  | 1,849 | 3   | 1,989 | 2   | 984 | ..  | ..  | 13  | 1,402 | 35  | 2,220 |
| 11 Coimbatore                           | ..  | ..  | 133 | 555   | 23  | 353   | 12  | 28  | 4   | 396 | ..  | ..    | ..  | ..    |
| 12 Nilgiris                             | ..  | ..  | 27  | 306   | ..  | ..    | ..  | ..  | ..  | ..  | ..  | ..    | ..  | ..    |

|                   | (8) |       | (9) |       | (10) |     | (11) |     | (12) |       | (13) |       | (14) |     |
|-------------------|-----|-------|-----|-------|------|-----|------|-----|------|-------|------|-------|------|-----|
|                   | T.  | LB.   | T.  | LB.   | T.   | LB. | T.   | LB. | T.   | LB.   | T.   | LB.   | T.   | LB. |
| 1 Chingleput      | ..  | ..    | ..  | ..    | ..   | ..  | ..   | ..  | 1    | 2,326 | ..   | ..    | 1    | 173 |
| 2 North Arcot     | ..  | ..    | ..  | ..    | ..   | ..  | 0    | 180 | 8    | 1,038 | ..   | ..    | 1    | 490 |
| 3 South Arcot     | 0   | 1,310 | ..  | ..    | ..   | ..  | ..   | ..  | 1    | 785   | ..   | ..    | 1    | 525 |
| 4 Thanjavur       | 0   | 70    | ..  | ..    | ..   | ..  | ..   | ..  | 0    | 1,680 | ..   | ..    | 1    | 828 |
| 5 Tiruchirappalli | ..  | ..    | ..  | ..    | ..   | ..  | ..   | ..  | 0    | 387   | ..   | ..    | 3    | 953 |
| 6 Madurai         | ..  | ..    | 0   | 1,470 | ..   | ..  | 0    | 66  | 0    | 178   | ..   | ..    | ..   | ..  |
| 7 Ramanathapuram  | 0   | 92    | 0   | 62    | ..   | ..  | 0    | 38  | 1    | 886   | ..   | ..    | 5    | 802 |
| 8 Tirunelveli     | ..  | ..    | ..  | ..    | ..   | ..  | ..   | ..  | 0    | 749   | ..   | ..    | ..   | ..  |
| 9 Kanyakumari     | ..  | ..    | ..  | ..    | ..   | ..  | 0    | 215 | 1    | 1,840 | ..   | ..    | 1    | 213 |
| 10 Salem          | 0   | 503   | 0   | 1,136 | ..   | ..  | 0    | 507 | 1    | 570   | 5    | 1,210 | ..   | ..  |
| 11 Coimbatore     | ..  | ..    | 0   | 726   | ..   | ..  | ..   | ..  | ..   | ..    | ..   | ..    | ..   | ..  |
| 12 Nilgiris       | ..  | ..    | ..  | ..    | 487  | 978 | ..   | ..  | ..   | ..    | ..   | ..    | ..   | ..  |

## APPENDIX NO. 11.

Statement showing the targets and achievements under area and production of cotton during 1958-59 and 1959-60.

| Serial number and particulars.             | Area in acres, 1958-59. |              | Area in acres, 1959-60. |              | Production in bales, 1958-59. |              | Production in bales, 1959-60. |              |
|--------------------------------------------|-------------------------|--------------|-------------------------|--------------|-------------------------------|--------------|-------------------------------|--------------|
|                                            | Target.                 | Achievement. | Target.                 | Achievement. | Target.                       | Achievement. | Target.                       | Achievement. |
| (1)                                        | (2)                     | (3)          | (4)                     | (5)          | (6)                           | (7)          | (8)                           | (9)          |
| I. Extensive cultivation—                  |                         |              |                         |              |                               |              |                               |              |
| (a) Reclamation of fallow and waste lands. | 8,000                   | 10,116       | 10,000                  | 12,572       | 2,000                         | 2,529        | 2,500                         | 3,143        |
| (b) By replacement of crops ..             | 38,000                  | 8,482        | 57,000                  | 31,098       | 19,000                        | 4,241        | 28,500                        | 15,549       |
| (c) Double cropping ..                     | 61,000                  | 45,340       | 73,500                  | 32,948       | 30,500                        | 22,670       | 36,750                        | 16,474       |
| II. Intensive cultivation—                 |                         |              |                         |              |                               |              |                               |              |
| (a) Inter-cropping ..                      | 72,000                  | 74,272       | 80,000                  | 57,464       | 9,000                         | 9,284        | 10,000                        | 6,933        |
| (b) Distribution of improved seeds ..      | 285,000                 | 334,900      | 367,500                 | 311,216      | 11,400                        | 13,360       | 14,700                        | 12,450       |
| (c) Application of fertilizers ..          | 158,000                 | 83,680       | 214,000                 | 138,016      | 19,500                        | 10,460       | 26,750                        | 17,252       |
| (d) Plant protection measures ..           | 400,000                 | 78,000       | 480,000                 | 335,040      | 5,000                         | 975          | 6,000                         | 4,188        |
| (e) Improved cultivation methods ..        | 48,000                  | 98,880       | 64,000                  | 298,960      | 600                           | 1,236        | 800                           | 3,737        |

## APPENDIX No. 12.

Statement showing the district wise distribution of tractors and bull-dozers as on 30th June 1960.

| District.                                                 | (1) | Track type tractors with bulldozers. |     | Track type tractors without bulldozers. |     | Wheel type tractors. |     | Total. |
|-----------------------------------------------------------|-----|--------------------------------------|-----|-----------------------------------------|-----|----------------------|-----|--------|
|                                                           |     | (2)                                  | (3) | (4)                                     | (5) | (6)                  | (7) |        |
| North Arcot                                               | ..  | 7                                    | ..  | 3                                       | 10  | ..                   | ..  | ..     |
| Chingleput                                                | ..  | 6                                    | 1   | 7                                       | 14  | ..                   | ..  | ..     |
| South Arcot                                               | ..  | 4                                    | ..  | 12                                      | 16  | ..                   | ..  | ..     |
| Thanjavur                                                 | ..  | 14                                   | ..  | 4                                       | 18  | ..                   | ..  | ..     |
| Tiruchirappalli                                           | ..  | 5                                    | ..  | 8                                       | 13  | ..                   | ..  | ..     |
| Madurai                                                   | ..  | 4                                    | ..  | 7                                       | 11  | ..                   | ..  | ..     |
| Tirunelveli                                               | ..  | 3                                    | ..  | 5                                       | 8   | ..                   | ..  | ..     |
| Ramanathapuram                                            | ..  | 5                                    | ..  | 7                                       | 12  | ..                   | ..  | ..     |
| Salem                                                     | ..  | 6                                    | ..  | 2                                       | 8   | ..                   | ..  | ..     |
| Coimbatore                                                | ..  | 12                                   | ..  | 3                                       | 15  | ..                   | ..  | ..     |
| Nilgiris                                                  | ..  | 12                                   | ..  | ..                                      | 12  | ..                   | ..  | ..     |
| Kanyakumari                                               | ..  | ..                                   | ..  | ..                                      | ..  | ..                   | ..  | ..     |
| Superintendent, Agricultural Research Station, Tindivanam | ..  | ..                                   | ..  | 1                                       | 1   | ..                   | ..  | ..     |
| Total                                                     | ..  | 78                                   | 1   | 59                                      | 139 | ..                   | ..  | ..     |

## APPENDIX 13.

Particulars of type of tractors and their horse-power held by the department as on 30th June 1960.

| Name and type of tractor.              | (1) | Horse<br>power. | (2)  | Tractors<br>with bull-<br>dozers. | (3) | Tractors<br>without<br>bulldozers. | (4) | Wheel type<br>tractors. | (5) | Total. |
|----------------------------------------|-----|-----------------|------|-----------------------------------|-----|------------------------------------|-----|-------------------------|-----|--------|
|                                        |     |                 |      |                                   |     |                                    |     |                         |     |        |
| <b>Small type—</b>                     |     |                 |      |                                   |     |                                    |     |                         |     |        |
| Mecormick Deering W. 4                 | ..  | ..              | 25   | ..                                | ..  | ..                                 | ..  | 2                       | 2   | 2      |
| Masey Harris 20 K.                     | ..  | ..              | 22   | ..                                | ..  | ..                                 | ..  | 8                       | 8   | 8      |
| Masey Harris 30 K.                     | ..  | ..              | 18.5 | ..                                | ..  | ..                                 | ..  | 7                       | 7   | 7      |
| <b>Medium type—</b>                    |     |                 |      |                                   |     |                                    |     |                         |     |        |
| I.H.C. W.D. 9                          | ..  | ..              | 40   | ..                                | ..  | ..                                 | ..  | 5                       | 5   | 5      |
| T.D. 9                                 | ..  | ..              | 40   | 3                                 | ..  | ..                                 | ..  | ..                      | 3   | 3      |
| W. 6                                   | ..  | ..              | 30   | ..                                | ..  | ..                                 | ..  | 15                      | 15  | 15     |
| T. 6                                   | ..  | ..              | 30   | 14                                | 1   | ..                                 | ..  | ..                      | 15  | 15     |
| T.D. 6                                 | ..  | ..              | 34   | 4                                 | ..  | ..                                 | ..  | ..                      | 4   | 4      |
| Caterpillar—D. 4                       | ..  | ..              | 45   | 14                                | ..  | ..                                 | ..  | ..                      | 14  | 14     |
| John. Deer (A, A.W., AR and HC Models) | ..  | ..              | 40   | ..                                | ..  | ..                                 | ..  | 10                      | 10  | 10     |
| David Brown                            | ..  | ..              | 25   | ..                                | ..  | ..                                 | ..  | 9                       | 9   | 9      |
| Fordson Major                          | ..  | ..              | 30   | ..                                | ..  | ..                                 | ..  | 3                       | 3   | 3      |
| <b>Heavy type—</b>                     |     |                 |      |                                   |     |                                    |     |                         |     |        |
| Caterpillar—D. 6                       | ..  | ..              | 60   | 23                                | ..  | ..                                 | ..  | ..                      | 23  | 23     |
| Caterpillar—D. 7                       | ..  | ..              | 75   | 11                                | ..  | ..                                 | ..  | ..                      | 11  | 11     |
| I.H.C. T.D. 14                         | ..  | ..              | 65   | 9                                 | ..  | ..                                 | ..  | ..                      | 9   | 9      |
| Total                                  | ..  | ..              | ..   | 78                                | 1   | 59                                 | ..  | ..                      | 138 | 138    |



## APPENDIX 16.

Statement showing the progressive increase in hire charges on tractors and bulldozers.

| Particulars of work                | (1) | From 1st April 1946 to 30th June 1950. |     | From 1st July 1950 to 31st March 1952. |     | From 1st April 1952. |     | From 31st December 1954. (G.O. Ms. No. 387, Food and Agriculture, dated 2nd December 1954.) |     |
|------------------------------------|-----|----------------------------------------|-----|----------------------------------------|-----|----------------------|-----|---------------------------------------------------------------------------------------------|-----|
|                                    |     | Rs.                                    | (2) | Rs.                                    | (3) | Rs.                  | (4) | Rs.                                                                                         | (5) |
| Ploughing by all types of tractors |     | 5 per acre.                            | 5   | 10 per acre.                           | 10  | 12 per acre.         | 12  | 12 per acre.                                                                                | 12  |
| Ploughing shallow ploughing        |     | 3 "                                    | 3   | 5 "                                    | 5   | 7 "                  | 7   | 7 "                                                                                         | 7   |
| Leveling with bulldozers—          |     | 9 per hour.                            | 9   | 12 per hour.                           | 12  | 14 per hour.         | 14  | 17 per hour.                                                                                | 17  |
| D-7 Type                           |     | 7 "                                    | 7   | 10 "                                   | 10  | 12 "                 | 12  | 16 "                                                                                        | 16  |
| D-6 "                              |     | 7 "                                    | 7   | 10 "                                   | 10  | 12 "                 | 12  | 16 "                                                                                        | 16  |
| TD-14 "                            |     | 7 "                                    | 7   | 8 "                                    | 8   | 10 "                 | 10  | 13 "                                                                                        | 13  |
| TD-9 "                             |     | 7 "                                    | 7   | 8 "                                    | 8   | 10 "                 | 10  | 12 "                                                                                        | 12  |
| TD-6 "                             |     | 7 "                                    | 7   | 8 "                                    | 8   | 10 "                 | 10  | 13 "                                                                                        | 13  |
| T-6 "                              |     | 7 "                                    | 7   | 8 "                                    | 8   | 10 "                 | 10  | 13 "                                                                                        | 13  |
| D-4 "                              |     | 5 "                                    | 5   | 8 "                                    | 8   | 10 "                 | 10  | 13 "                                                                                        | 13  |

## APPENDIX 17.

Statement showing the acreage tackled by the departmental tractors from 1st July 1959 to 30th June 1960.

|                                                          | Virgin. | Current fallows.    |
|----------------------------------------------------------|---------|---------------------|
| 1 Target in acres                                        | 12,085  | 17,290              |
| 2 Outturn in acres                                       | 5,585   | 8,991               |
| 3 Number of hours worked by bulldozers.                  | 62,476½ |                     |
| 4 Additional food production in tons (in terms of rice). | 1,396   | 899                 |
| 5 Number of track type tractors with bulldozers.         | 78      |                     |
| 6 Number of track type tractors without bulldozers.      | 1       |                     |
| 7 Number of wheel type tractors                          | 59      |                     |
| 8 Hire charges collected                                 |         | Rs. 9,12,686.56 nP. |

## APPENDIX 18.

Statement showing tractors and implements available with the Department as on 30th June 1960.

| Particulars.                                                      | Number available. |     |
|-------------------------------------------------------------------|-------------------|-----|
| 1 Tractors                                                        | Track type 79     | 138 |
|                                                                   | Wheel type 59     |     |
| 2 Bulldozers attachments                                          |                   | 78  |
| 3 Mould Board plough and Harrows                                  |                   | 88  |
| 4 Disc harrows, ploughs cultivators and tillers seed drills, etc. |                   | 144 |
| 6 Rotavators                                                      |                   | 8   |

## APPENDIX 19.

Statement showing the jurisdiction of Assistant Agricultural Engineers and officers in-charge of engineering activities including Pumping and Boring sections as on 30th June 1960.

| Serial number and name of Assistant Agricultural Engineer and headquarters. | Names of district or districts in his jurisdiction.                                                                   |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1 Assistant Agricultural Engineer, Saidapet, Saidapet.                      | Chingleput district.                                                                                                  |
| 2 Assistant Agricultural Engineer, Cuddalore, Cuddalore.                    | South Arcot district.                                                                                                 |
| 3 Assistant Agricultural Engineer, Tiruchirappalli, Tiruchirappalli.        | Tiruchirappalli district and inspection control in Thanjavur district. Also in-charge of Tractor Workshop, Tiruvarur. |
| 4 District Agricultural Officer, Thanjavur, Thanjavur.                      | Thanjavur district (Administrative work only).                                                                        |
| 5 Assistant Agricultural Engineer, Madurai, Madurai.                        | Madurai and Ramanathapuram district.                                                                                  |
| 6 Assistant Agricultural Engineer, Tirunelveli, Tirunelveli.                | Tirunelveli and Kanyakumari district.                                                                                 |
| 7 Assistant Agricultural Engineer, Coimbatore, Coimbatore.                  | Coimbatore and Nilgiris district.                                                                                     |
| 8 Assistant Director of Drilling, Salem.                                    | Salem district.                                                                                                       |

## APPENDIX No. 20.

*List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960.*

| Serial number and particulars.                                                                               | Quantity. | Amount. |
|--------------------------------------------------------------------------------------------------------------|-----------|---------|
| (1)                                                                                                          | (2)       | (3)     |
|                                                                                                              |           | Rs. NP. |
| 1 Manufacturing plate for D7 rollers P. No. 7B. 9551 for D7 4T. 3894.                                        | 14 Nos.   | 108 66  |
| 2 Manufacturing link pin for D7 idler wheel shaft P. No. 7F 2022.                                            | 8 ..      | 19 20   |
| 3 Manufacturing strips for D7, 4T. 3894 P. No. 8B. 985.                                                      | 4 ..      | 40 88   |
| 4 Manufacturing G.M. Bushing for D7 roller 1F 8208.                                                          | 13 ..     | 118 84  |
| 5 Manufacturing dovels for track frame roller of D7. 2590 P. No. 3B. 2484.                                   | 4 ..      | 4 14    |
| 6 Manufacturing extension sleeve for fixing grease nipple for D7. 4T. 2590.                                  | 6 ..      | 13 90   |
| 7 Manufacturing Oil cooler support studs for D7. 2590 P. No. 6B. 2882.                                       | 6 ..      | 4 14    |
| 8 Manufacturing oil cooler support studs for D7 2590 P. No. 2A. 3-82.                                        | 4 ..      | 5 12    |
| 9 Manufacturing piston pin bushes for 20K M.H. MDC 4514.                                                     | 4 ..      | 25 80   |
| 10 Manufacturing water pump shaft for 20K. M.H. MDC 4514.                                                    | 1 No.     | 10 88   |
| 11 Manufacturing inlet valves for 20K. M.H. MDC 4514.                                                        | 4 Nos.    | 15 58   |
| 12 Manufacturing cotter pins for D7. showed 2590 P. No. C. 1051.                                             | 24 ..     | 36 28   |
| 13 Manufacturing D6 clutch link P. No. 9B. 399.                                                              | 22 ..     | 392 14  |
| 14 Manufacturing and supplying (1) Motor pulley, (2) Pump shaft and (3) Bushing.                             | 3 ..      | 67 58   |
| 15 Manufacturing locks for idler wheel studs for D7 4T. 2590 D7. 4T. 6298 and D7. 4T. 3894 Part No. 1F 8283. | 16 ..     | 17 00   |
| 16 Manufacturing carrier roller shaft sleeve for D7. 4T. 3894.                                               | 8 ..      | 54 62   |
| 17 Casting and supplying 3 Nos. in each of the following:—                                                   |           |         |
| (1) R. seed Drill base .. 3 Nos.                                                                             | 15 ..     | 212 53  |
| (2) Seed plate .. 3 ..                                                                                       |           |         |
| (3) Drive gear .. 3 ..                                                                                       |           |         |
| (4) Driven gear .. 3 ..                                                                                      |           |         |
| (5) Hub .. 3 ..                                                                                              |           |         |
| 18 Manufacturing one chisel by using 1" octagonal steel rod.                                                 | 4 ..      | 12 57   |
| 19 Manufacturing rivets for D7, 4T. 3894 P. No. 4F 4418.                                                     | 78 ..     | 21 37   |
| 20 Manufacturing main gear, drive gear shaft bushing for M.H. MDR 1893.                                      | 1 No.     | 11 22   |
| 21 Manufacturing clutch shaft bushing for M.H. MDR. 1893.                                                    | 2 Nos.    | 11 22   |
| 22 Manufacturing hydraulic pump support bolt P. No. 19H. 539 R.                                              | 1 No.     | 8 78    |
| 23 Manufacturing lock pin for D7. idler wheel P. No. 7F. 2022 for D7. 6298.                                  | 2 Nos.    | 5 14    |
| 24 Manufacturing brass bushing for D7 brake pedal P. No. 8B. 3313 for D7. 6298.                              | 2 ..      | 11 12   |
| 25 Manufacturing king pin bushes for W6. MDU. 6775.                                                          | 2 ..      | 26 52   |
| 26 Manufacturing rear spring bush for lorry MSC 9581.                                                        | 2 ..      | 24 92   |

## APPENDIX No. 20—cont.

*List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.                                                                  | Quantity. | Amount. |
|-------------------------------------------------------------------------------------------------|-----------|---------|
| (1)                                                                                             | (2)       | (3)     |
|                                                                                                 |           | Rs. NP. |
| 27 Manufacturing front spring bush for lorry MSC 9581.                                          | 2         | 16 44   |
| 28 Manufacturing C.I. Bracket for M.H. Disc. Plough P. No. P.O.B. 58.                           | 1 No.     | 50 59   |
| 29 Manufacturing one 5/8" bolt to ring ..                                                       | 1 ..      | 9 79    |
| 30 Manufacturing square washer 1/2" thick for bolt.                                             | 1 ..      | 2 68    |
| 31 Manufacturing 5/8 nut to suit the hook bolt.                                                 | 1 ..      | 3 78    |
| 32 Manufacturing and supply of germination tray as per specimen sent.                           | 6 ..      | 77 42   |
| 33 Manufacturing the share point for ridger plough.                                             | 12 ..     | 90 63   |
| 34 Manufacturing iron stand for stores use ..                                                   | 3 ..      | 195 66  |
| 35 Manufacturing patter in aluminium alloy for making crankshaft pulley of D6. P. No. 4F. 8031. | 1 No.     | 178 88  |
| 36 Manufacturing and supply of tempering tub.                                                   | 1 ..      | 113 80  |
| 37 Manufacturing share point for monsoon plough.                                                | 23 Nos.   | 97 02   |
| 38 Manufacturing share points for ridge plough.                                                 | 6 Nos.    | 43 54   |
| 39 Manufacturing one G.M. Clutch collar for D4. tractor P. No. 3B 697.                          | 2 sets.   | 154 59  |
| 40 Manufacturing the crank handle for DD 10 Drill.                                              | 1 No.     | 19 31   |
| 41 Manufacturing the jaw clutch key as per sample for DD. 10 drill.                             | 1 ..      | 12 93   |
| 42 Manufacturing and supply of stud for radiator support of D7. 6298 P. No. 2A 3882.            | 6 Nos.    | 8 88    |
| 43 Manufacturing steering pump retainer D7. Part No. 6B. 7637.                                  | 1 No.     | 32 70   |
| 44 Manufacturing and supply of gear wheels as per sample 44T. 20T. 10T.                         | 6 Nos.    | 120 58  |
| 45 Manufacturing lock washers for bellow seal housing for TD 6. 20968.                          | 6 ..      | 7 26    |
| 46 Manufacturing and supply of bolts ..                                                         | 12 ..     | 15 56   |
| 47 Manufacturing and supply of main clutch shaft for D4.                                        | 6 ..      | 284 59  |
| 48 Manufacturing clutch links of D6. tractor P. No. 9B. 399.                                    | 24 ..     | 387 15  |
| 49 Manufacturing and supply of sworning blades with handles.                                    | 6 ..      | 20 08   |
| 50 Manufacturing and supply of grass cutting sword as per size with wooden handle.              | 24 ..     | 54 70   |
| 51 Manufacturing and supplying rings for mammutti handle.                                       | 60 ..     | 45 94   |
| 52 Manufacturing master pin for D7. 4T. 3872.                                                   | 2 ..      | 23 33   |
| 53 Manufacturing and supply of frame for the lamp post.                                         | 1 No.     | 20 25   |
| 54 Manufacturing and supplying master pin collars for D7. 3872 and 8078.                        | 8 Nos.    | 10 46   |
| 55 Manufacturing the radiator bed bolt for D7. 5822 P. No. 3F 8328.                             | 8 ..      | 20 36   |
| 56 Manufacturing idler lock for D7. P.No. 1F 8283 for D7. 5822.                                 | 16 ..     | 25 36   |

## APPENDIX No. 20—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                             | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. P. |
|-----------------------------------------------------------------------------------|------------------|--------------------------|
| 57 Manufacturing gun metal bushes for clutch collar of TD6. 20968 P.No. CL. 3559. | 2 Nos.           | 19 42                    |
| 58 Manufacturing cap screw for steering drum of D7. P.No. 9B. 3175.               | 8 "              | 59 35                    |
| 59 Manufacturing and supplying 3 Nos. of tempering tubs.                          | 3 "              | ..                       |
| 60 Manufacturing gun metal solid rods from G.M. scraps.                           | 3 "              | 59 65                    |
| 61 Manufacturing valve stem for D4. valve cutter.                                 | 1 No.            | 2 58                     |
| 62 Manufacturing shaft for Brake pedal of D7. 3894. P.No. 8B. 7293.               | 2 Nos.           | 5 93                     |
| 63 Manufacturing front idler lock bolt for D4. 3482 P. No. 4B. 868.               | 1 No.            | 5 51                     |
| 64 Manufacturing wooden work benches 8' x 3' x 3'.                                | 2 Nos.           | 437 21                   |
| 65 Manufacturing bushing 1F 2571 for D7. ..                                       | 4 "              | 102 72                   |
| 66 Manufacturing bushing 1F 2572 for D7. ..                                       | 4 "              | 17 33                    |
| 67 Manufacturing iron rack .. .. .                                                | 1 No.            | 304 50                   |
| 68 Manufacturing hub for D6 P.No. 7B. 203 ..                                      | 2 Nos.           | 80 28                    |
| 69 Manufacturing bolt recoil spring with nut.                                     | 3 "              | 92 48                    |
| 70 Manufacturing valve seat cutters of series of D6.                              | 2 "              | 40 82                    |
| 71 Manufacturing oil engine valve cutters of R. N. and crossley engine.           | 2 sets.          | 54 21                    |
| 72 Manufacturing and supply of fly wheel as per sample.                           | 2 Nos.           | 26 28                    |
| 73 Manufacturing and supply of small gears ..                                     | 2 "              | 10 18                    |
| 74 Manufacturing of big gears.                                                    | 2 "              | 15 27                    |
| 75 Manufacturing iron rims of D6. P.No. 6B 7336.                                  | 4 "              | 61 33                    |
| 76 Manufacturing push beam bearing bolt long.                                     | 4 "              | 14 01                    |
| 77 Manufacturing puller set 8B. 7548 with screws.                                 | 1 set.           | 186 13                   |
| 78 Manufacturing wodes No. 3247 A in puller set.                                  | ..               | 49 33                    |
| 79 Manufacturing pulley for D6. P.No. 4F. 8031                                    | ..               | 114 99                   |
| 80 Manufacturing rim for D6. P.No. 7B. 7367..                                     | 2 Nos.           | 10 59                    |
| 81 Manufacturing valve cutters for D2., D4. and D6 tractors.                      | 2 sets.          | 39 37                    |
| 82 Manufacturing valve cutters for W6. T6 and TD 9 TD. 14.                        | 4 "              | 66 95                    |
| 83 Manufacturing valve cutters for lorries and jeep.                              | 2 "              | 74 53                    |
| 84 Manufacturing valve seat cutters for D4 inlet and exhaust.                     | 2 Nos.           | 12 42                    |
| 85 Manufacturing C. I. wheels and milly fane for the dust pins.                   | ..               | 145 46                   |
| 86 Manufacturing exhaust valve No. 4F. 212 for D4.                                | 8 Nos.           | 5 96                     |
| 87 Manufacturing arm No. 5F 9040 puller set.                                      | ..               | 25 45                    |
| 88 Manufacturing crankshaft front pulley for D6.                                  | 2 Nos.           | 82 91                    |
| 89 Manufacturing gun metal bushes for D7. ..                                      | 12 Nos.          | 436 67                   |

## APPENDIX No. 20—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                               | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. P. |
|-----------------------------------------------------------------------------------------------------|------------------|--------------------------|
| 90 Manufacturing and supply of grass cutting sword as per size.                                     | 24 Nos.          | 54 71                    |
| 91 Manufacturing water pump impeller for engine drill No. DD7. hercules D.E.                        | ..               | 41 00                    |
| 92 Manufacturing and supply of victory plough share points.                                         | 4 dozens.        | 6 40                     |
| 93 Manufacturing transmission main shaft for D7.                                                    | ..               | 1,013 30                 |
| 94 Manufacturing nuts for shovel adjustment bolt.                                                   | 6 Nos.           | 92 74                    |
| 95 Manufacturing clutch pressure plate (A. 20 R).                                                   | ..               | 54 91                    |
| 96 Manufacturing tempering tub and supply ..                                                        | 3 Nos.           | 256 23                   |
| 97 Manufacturing water pump gland nut of D7.                                                        | 1 No.            | 46 49                    |
| 98 Manufacturing steering drum shafts for D7.                                                       | 2 Nos.           | 209 07                   |
| 99 Manufacturing wooden sliding block to suit demicils channel of DD17.                             | 4 Nos.           | 45 34                    |
| 100 Manufacturing shock absorber in the pin with collar for drill DD17.                             | 1                | 14 61                    |
| 101 Manufacturing round bars for moulding section use of Tractor Workshop, Coimbatore. as per size. | 4 Nos.           | 38 50                    |
| 102 Manufacturing plate washers as per sample for Drill PD9.                                        | 2 Nos.           | 4 31                     |
| 103 Manufacturing dusting for clutch shaft of D7. part No. 8B. 7297                                 | 4 Nos.           | 19 04                    |
| 104 Manufacturing gun metal bush for spudding crank arm of drill DD17.                              | 1                | 49 33                    |
| 105 Manufacturing a pin for pitman drill of DD17.                                                   | 1                | 54 67                    |
| 106 Manufacturing spudding sleeve pin and bush for drill DD17.                                      | 1                | 105 02                   |
| 107 Manufacturing Radiator cap for D7. 7M. 7952 part No. 1F 5547.                                   | 1                | 8 86                     |
| 108 Manufacturing plate washer for spudding crank pin of drill DD17.                                | 4                | 8 86                     |
| 109 Manufacturing supply of studs as per sample for pump.                                           | 3                | 7 36                     |
| 110 Manufacturing and supply fly wheel pins for D7. 4T. 2491                                        | 4 Nos.           | 62 50                    |
| 111 Manufacturing and supply wheel C.I. as per sample.                                              | 6                | 245 39                   |
| 112 Manufacturing and supply roller as per sample.                                                  | 6                | ..                       |
| 113 Manufacturing and supply pattern in aluminium alloy for roller.                                 | 1 set.           | 216 60                   |
| 114 Manufacturing and fuel filter centre stud for R. N. engine 10F. 5318.                           | 1                | 7 99                     |
| 115 Manufacturing handles for decorticator ..                                                       | 4                | 8 58                     |
| 116 Manufacturing and supply of iron cylinders 2" dia. and 3" long for connecting guntake.          | 12               | 32 41                    |
| 117 Manufacturing M.S. Moulding bolts for workshop moulding section use.                            | 2                | 65 20                    |
| 118 Manufacturing and supply smith tong as per sample for drilling section.                         | 6                | 96 50                    |
| 119 Manufacturing shaft (for steering lever) of D7 8678, 4180, 2491, Part No. 637979.               | 4 Nos.           | 38 08                    |



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APPENDIX No. 20—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                  | Quantity.<br>(2) | Amount.<br>(3)<br>rs. xP. |
|----------------------------------------------------------------------------------------|------------------|---------------------------|
| 120 Manufacturing clutch lever clamp shaft for D7.4180, 8028, P. No. 8B 7294.          | 2                | 12 59                     |
| 121 Manufacturing brake pedal pin for D7. 4180 P. No. 8B 7294.                         | 2                | 5 76                      |
| 122 Manufacturing valves for 30K. M.H. Tractor inlet and exhaust.                      | 2                | 11 90                     |
| 123 Manufacturing stand for (supporting axle, jeep).                                   | 4                | 138 90                    |
| 124 Manufacturing shackle pin bush and anchor bushes for college bus 9718.             | 12 Nos.          | 82 66                     |
| 125 Manufacturing bushing for steering stud P. No. 1F 1310.                            | 4 ..             | 30 30                     |
| 126 Manufacturing gland bush and gland nut as per sample for H.O. water pump.          | 2 ..             | 13 24                     |
| 127 Manufacturing bushing P.No. 7B 8257 for D7.                                        | 6 ..             | 15 10                     |
| 128 Manufacturing bushing gun for brake pedal.                                         | 2                | 29 33                     |
| 129 Manufacturing clamps for 3" pipe in 1/4" plate.                                    | 1 set.           | 78 00                     |
| 130 Manufacturing angle iron bed in 3" x 3" x 4" length for pump with foundation bolt. | 1 ..             | 36 91                     |
| 131 Manufacturing G.I. wheels and rolly frame for the dust bins of workshop use.       | 3 Nos.           | 42 69                     |
| 132 Manufacturing puller set with screw rods ..                                        | 1 set.           | 52 28                     |
| 133 Manufacturing crank shaft front pulley for D6.                                     | 2 Nos.           | 27 05                     |
| 134 Manufacturing and supply victory plough shaft points.                              | 48 ..            | 171 56                    |
| 135 Manufacturing transmission main shaft for D7.P.No.8B 836                           | 2 ..             | 255 75                    |
| 136 Manufacturing nuts for shewel adjustment bolt.                                     | 8 ..             | 47 04                     |
| 137 Manufacturing steering drum shafts for D7.                                         | 2 ..             | 37 60                     |
| 138 Manufacturing and supply borewell cover in 11 1/2 size with bolt.                  | 1 set.           | 40 82                     |
| 139 Manufacturing cap screw for D7. 6298 ..                                            | 4                | 18 27                     |
| 140 Manufacturing clutch collar for D4. tractor.                                       | 4 sets.          | 130 92                    |
| 141 Manufacturing of gear shaft sleeve for D7.                                         | 1                | 14 67                     |
| 142 Manufacturing bushing for D7 clutch joke.                                          | 2 Nos.           | 14 58                     |
| 143 Manufacturing C clamps .. ..                                                       | 2 ..             | 14 97                     |
| 144 Manufacturing VI clamps for wooden block.                                          | 1                | 11 50                     |
| 145 Manufacturing D6 roller cup screw .. ..                                            | 17               | 48 54                     |
| 146 Sliding block with sideplates .. ..                                                | 2                | 68 18                     |
| 147 Spudding main bearing .. ..                                                        | 1                | 10 20                     |
| 148 Pitman pin .. ..                                                                   | 2                | 28 02                     |
| 149 Bearing spudding main .. ..                                                        | 1                | 12 04                     |
| 150 Clutch shifter pads .. ..                                                          | 2                | 32 12                     |
| 151 Full real shaft side wooden bearing .. ..                                          | 2                | 23 46                     |
| 152 Manufacturing 30K. M.H. valve cutters ..                                           | 2 Nos.           | 25 13                     |
| 153 Manufacturing clutch life bracker .. ..                                            | 4 ..             | 74 22                     |
| 154 Manufacturing D7 hood cover .. ..                                                  | 1 No.            | 50 50                     |
| 155 Crown pully shaft for PD 9 .. ..                                                   | 1                | 10 18                     |

APPENDIX No. 20—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                | Quantity.<br>(2) | Amount.<br>(3)<br>rs. xP. |
|--------------------------------------------------------------------------------------|------------------|---------------------------|
| 156 Manufacturing one light bracket with clamp.                                      | 1                | 17 20                     |
| 157 Manufacturing screws as per sample (1A 7717).                                    | 1                | 4 16                      |
| 158 Manufacturing screws as per sample (1A 7716).                                    | 1                | 4 16                      |
| 159 Manufacturing pin .. ..                                                          | 4 Nos.           | 15 22                     |
| 160 Manufacturing bushing .. ..                                                      | 8 ..             | 222 91                    |
| 161 Manufacturing shaft .. ..                                                        | 2 ..             | 3 68                      |
| 162 Manufacturing lock washer .. ..                                                  | 24 ..            | 9 35                      |
| 163 Manufacturing bushing .. ..                                                      | 2 ..             | 41 64                     |
| 164 Manufacturing clutch nut for Stanley lathe.                                      | ..               | 59 58                     |
| 165 Manufacturing and supply of valves as per sample.                                | 8                | 36 03                     |
| 166 Manufacturing G.M. bush for clutch clamps pin.                                   | 2 Nos.           | 21 94                     |
| 167 Manufacturing and supply valve cutters tem for D7 tractor.                       | 1                | 10 40                     |
| 168 Manufacturing gasket for D7 (6B 7020) ..                                         | ..               | 5 09                      |
| 169 Manufacturing bushing for D7 (1F 6208) ..                                        | ..               | 117 96                    |
| 170 Manufacturing temp plates as per sample ..                                       | 3 Nos.           | 23 62                     |
| 171 Manufacturing double-bullock cart .. ..                                          | 1                | 350 45                    |
| 172 Manufacturing clutch link for D6 .. ..                                           | 18               | 344 76                    |
| 173 Manufacturing pins P. No. 8B 4135 .. ..                                          | 12               | 29 64                     |
| 174 Manufacturing cap screws P. No. 3F 6697 ..                                       | 32               | 114 10                    |
| 175 Manufacturing and supply wooden sleeper for mudstill.                            | 1 No.            | 226 62                    |
| 176 Manufacturing pattern in aluminium for casting bushes.                           | 2 Nos.           | 60 12                     |
| 177 Manufacturing and supply pump shaft 1, bushing 1.                                | 2 ..             | 58 82                     |
| 178 Manufacturing bushing for D7 carrier roller (1F 2572).                           | 8 ..             | 91 98                     |
| 179 Manufacturing bush in for D7. P. No. 1F. 2571.                                   | 8 ..             | 94 26                     |
| 180 Manufacturing hour meter shaft for D4. tractor.                                  | 4 ..             | 55 61                     |
| 181 Manufacturing and supply G.M. bushing for pump shaft.                            | 1                | 29 85                     |
| 182 Manufacturing and supply widge plough ..                                         | ..               | 89 28                     |
| 183 Manufacturing and supply of stud for hoist cylinder survival of C.P. III. drill. | 1                | 5 09                      |
| 184 Manufacturing and supply studs as per sample for PD 7.                           | 2                | 10 28                     |
| 185 Manufacturing clutch shaft for D4 tractor ..                                     | 2                | 98 86                     |
| 186 Manufacturing and supply fan pulley bush.                                        | 1                | 24 59                     |
| 187 Manufacturing and supply weights for gas tanks 8.                                | 25 Nos.          | 566 87                    |
| 188 Manufacturing and supply cooler for D4. tractor.                                 | 6 ..             | 29 35                     |
| 189 Manufacturing and supply trunion bearing bolt for nut for D7. P.No. C. 1575.     | 2 ..             | 26 32                     |
| 190 Manufacturing and supply pull and push rod ball for lorry 9616.                  | 1                | 10 97                     |

## APPENDIX No. 20—cont.

*List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                   | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|-------------------------------------------------------------------------|------------------|---------------------------|
| 191 Manufacturing and supply mandal for survival socket for PD 7 drill. | 2 Nos.           | 31 34                     |
| 192 Manufacturing and supply of sign board for oil seeds farm.          | 1                | 72 76                     |
| 193 Manufacturing share point for D4 tool bar attachment.               | 12 Nos.          | 34 08                     |
| 194 Manufacturing D7 steering drum .. ..                                | 2 ..             | 12 75                     |
| 195 Cap screw .. .. .                                                   | 2 ..             | 23 11                     |
| 196 Manufacturing arm (No 5F 9040) in puller set.                       | ..               | 248 50                    |
| 197 Manufacturing C.I Bushing (1F 6476) for D6.                         | ..               | 8 62                      |
| 198 Manufacturing of Junior hoe share points as per sample.             | 3 Nos.           | 20 71                     |
| 199 Manufacturing of Junior hoe share points side tyres.                | 24 ..            | 116 97                    |
| 200 Manufacturing key boxes of tell-tale clock.                         | 12 ..            | 94 65                     |
| 201 Manufacturing cap screws of 3 F 6697 for D4.                        | 16 ..            | 58 16                     |
| 202 Manufacturing clutch links for D6 P. No. 9B 399.                    | 21 ..            | 343 96                    |
| 203 Manufacturing hoes nipple 3/8" six-bore 3/16" for DD 7 engine.      | 1 No.            | 9 88                      |
| 204 Manufacturing Junior hoe tyres .. ..                                | 24 Nos.          | 76 16                     |
| 205 Manufacturing lock for special wheel of D7. 3872 P. No. 6B 4942.    | 12 ..            | 46 16                     |
| 206 Manufacturing shims for DD 9 drill. ..                              | 14 ..            | 18 65                     |
| 207 Manufacturing fuel funnels with filter gauge.                       | 6                | 33 25                     |
| 208 Manufacturing valve cutters and stem for vakeas engine.             | 2 Nos.           | 48 17                     |
| 209 Manufacturing iron stand for Hot water boiler.                      | 1                | 36 03                     |
| 210 Manufacturing shims as per sample ..                                | 60               | 39 21                     |
| 211 Manufacturing nail point chisel bar ..                              | 3                | 5 06                      |
| 212 Manufacturing jar air lock screws of lorry MSC 9851.                | 4                | 31 42                     |
| 213 Manufacturing shims for DD 9 drill ..                               | 12               | 29 03                     |
| 214 Manufacturing water pump shaft and bush for centrifugal pump.       | 1 set.           | 84 22                     |
| 215 Manufacturing valve guides for 2V engine ..                         | 4 Nos.           | 70 78                     |
| 216 Valve cutters for D4 tractors .. ..                                 | 4 ..             | 119 72                    |
| 217 Manufacturing C.I. rod .. .                                         | 2 ..             | 81 92                     |
| 218 Manufacturing cylinder head bolt of J.D. tractor.                   | 2                | 18 54                     |
| 219 Manufacturing wheel bolts for J.D. tractor MSZ 165.                 | 3                | 21 97                     |
| 220 Manufacturing pattern for tool bar share point.                     | 1                | 94 51                     |
| 221 Manufacturing tem plate for making holes in rallis bushing.         | 1                | 37 18                     |
| 222 Manufacturing pattern in Aluminium for crankshaft front pulley.     | 1 No.            | 103 22                    |
| 223 Manufacturing bed for radiator of D7. 3926.                         | 2 Nos.           | 48 80                     |
| 224 Manufacturing bushing for D7 P. No. 8-B 3313.                       | 4                | 21 27                     |

## APPENDIX No. 20—cont.

*List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                              | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|--------------------------------------------------------------------|------------------|---------------------------|
| 225 Manufacturing bushing steering lever 7B 9257.                  | 4 Nos.           | 8 20                      |
| 226 Manufacturing clutch cone bushing 1 F 2830.                    | 4                | 10 09                     |
| 227 Manufacturing clutch cone shaft P. No. 8B 7294.                | 2                | 4 08                      |
| 228 Manufacturing brake pedal shaft 8B 7293 ..                     | 4 Nos.           | 12 80                     |
| 229 Manufacturing steering shaft 6B 7293 ..                        | 1                | 6 71                      |
| 230 Manufacturing hydraulic pump shaft 8B 783 A.                   | 2 Nos.           | 26 63                     |
| 231 Manufacturing lock washer for D7 1 A 2226.                     | 5 ..             | 17 64                     |
| 232 Manufacturing temp plate for welding D7 roller cups.           | 1 set.           | 24 90                     |
| 233 Manufacturing rivets for D7 idler wheel strip.                 | 24               | 12 19                     |
| 234 Manufacturing D4 water pump shaft 7 F 2676.                    | 3                | 32 42                     |
| 235 Manufacturing carrier roller bushing 1 F 2571 and 1 F 2572.    | 16               | 195 28                    |
| 236 Manufacturing of writ pin for DD. 10 ..                        | 1                | 49 94                     |
| 237 Manufacturing pinion washer for D7 crown wheel shaft 2 F 2625. | 3                | 17 75                     |
| 238 Manufacturing scraper and providing bamboo handles.            | 2                | 7 00                      |
| 239 Manufacturing coir filter point .. ..                          | 5 Nos.           | 49 67                     |
| 240 Manufacturing zinc condensers as per sample.                   | 12 ..            | 56 72                     |
| 241 Manufacturing shed for radiator support 7B 9903.               | 8 ..             | 10 74                     |
| 242 Manufacturing valve guides for Ruston engine.                  | 1 No.            | 25 46                     |
| 243 Manufacturing cost iron rods .. ..                             | 2 ..             | 31 46                     |
| 244 Manufacturing lock for D7 P. 6B 8357 ..                        | 8 ..             | 10 12                     |
| 245 Manufacturing clamp as per sketch ..                           | 3 ..             | 25 59                     |
| 246 Manufacturing water pump shaft P. No. 8B 2578.                 | 2                | 33 72                     |
| 247 Manufacturing A 1 pattern for G.M. Bush 8B 2495.               | 1                | 27 46                     |
| 248 Manufacturing bushing for D4. side arm bracket 3B 2495.        | 4 Nos.           | 98 71                     |
| 249 Manufacturing C.I. pulleys as per sample ..                    | 3 ..             | 64 30                     |
| 250 Manufacturing C.I. shaft .. .. .                               | 1                | 33 87                     |
| 251 Manufacturing lock for D7 P. No. 1A 8226.                      | 35               | 14 49                     |
| 252 Manufacturing bolt for pulley .. ..                            | 1                | 4 31                      |
| 253 Manufacturing clutch pressure plate P. No. A. 20               | ..               | 41 91                     |
| 254 Manufacturing water pump gland nut ..                          | ..               | 25 45                     |
| 255 Manufacturing double bullock cart .. ..                        | ..               | 116 75                    |
| 256 Manufacturing and supply weight for gas tanks.                 | ..               | 475 66                    |
| 257 Manufacturing and supply of ridge plough.                      | ..               | 177 22                    |
| 258 Manufacturing share point for D4 tool bar.                     | 12 Nos.          | 219 69                    |
| 259 Manufacturing steering D7 shaft .. ..                          | 2                | 120 65                    |

## APPENDIX No. 20—cont.

*List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particular.<br>(1)                                      | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. nP. |
|---------------------------------------------------------------------------|------------------|---------------------------|
| 260 Manufacturing C.I. bushing (1 F 64765) for D6.                        | 8                | 51 72                     |
| 261 Manufacturing puller set (8B 7548) with screw rod.                    | 1 set.           | 33 56                     |
| 262 Manufacturing arm No. 5F 9040 in puller set.                          | ..               | 12 51                     |
| 263 Manufacturing adopter No. 8B 7556 in puller set.                      | ..               | 56 37                     |
| 264 Manufacturing G.M. bushes for D7. tractor roller (1F 6208)            | 24               | 66 17                     |
| 265 Manufacturing G.M. bushing for D7. carrier roller (1F 2572).          | 8 Nos.           | 37 60                     |
| 266 Manufacturing G.M. for D7. carrier roller (1F 2571).                  | 8 ..             | 47 78                     |
| 267 Manufacturing and supply water pump shaft with key.                   | 3                | 20 92                     |
| 268 Manufacturing water pump impeller for engine drill No. DD7.           | ..               | 5 09                      |
| 269 Manufacturing clutch collar for D4. (3B 697).                         | 4 sets.          | 55 83                     |
| 270 Manufacturing clutch lift bracket .. ..                               | 2 Nos.           | 11 26                     |
| 271 Manufacturing gasket P. No. (6B. 7020).                               | 8 ..             | 32 28                     |
| 272 Manufacturing G.M. bushing for D7. roller.                            | ..               | 25 45                     |
| 273 Manufacturing and supply measuring sticks.                            | 12 Nos.          | 30 71                     |
| 274 Manufacturing clutch shaft for D4. tractor of P. No. 3B 2517.         | 6 ..             | 236 92                    |
| 275 Manufacturing wooden sleepers 6" x 4" x 9' long.                      | 3 Pairs.         | 249 48                    |
| 276 Manufacturing D7. recoil spring bolt P. No. 7B. 9726.                 | 4                | 272 29                    |
| 277 Manufacturing name boards as per sketch.                              | 2 Nos.           | 368 36                    |
| 278 Manufacturing G.K. surface block for milling machine attachments.     | 2                | 216 26                    |
| 279 Manufacturing strips for D7. grouser plates.                          | 74               | 467 83                    |
| 280 Manufacturing D7. clutch link assembly ..                             | 22               | 467 62                    |
| 281 Manufacturing coupling for D4. hydraulic pump shaft P. No. 4F 8936    | 6                | 52 69                     |
| 282 Manufacturing hydraulic pump shaft P. No. 4F 4408.                    | 6                | 98 59                     |
| 283 Manufacturing collar for hydraulic pump shaft for D4. P. No. 4F 4722. | 6                | 20 48                     |
| 284 Manufacturing wooden pattern for making surface block.                | 2                | 77 66                     |
| 285 Manufacturing dynamo bush for jeep MDC. 7879.                         | 1                | 4 62                      |
| 286 Manufacturing self starter and bushes ..                              | 3 Nos.           | 10 28                     |
| 287 Manufacturing steering bush .. ..                                     | 2                | 24 30                     |
| 288 Manufacturing clutch pads as per sample for R. B. C. II.              | 6                | 68 68                     |

## APPENDIX No. 20—cont.

*List of spare parts manufactured in the Tractor Workshop, Coimbatore, for the period from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                 | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. nP. |
|-----------------------------------------------------------------------|------------------|---------------------------|
| 289 Manufacturing wheel hub bolt as per sample for John Deer tractor. | 3                | 23 10                     |
| 290 Manufacturing lock pin for D7. idler wheel of P. No. 6B 5994.     | 8                | ..                        |
| 291 Manufacturing mortar and pestal for agriculture chemist section.  | 2                | 59 88                     |
| 292 Manufacturing shaft for steering lever of D7 P. No. 6B 7979.      | 1 No.            | 12 06                     |
| 293 Manufacturing bushing for steering shaft of D7. P. No. 7B. 9257.  | 2                | 7 10                      |
| 294 Manufacturing bushing for clutch lever of D7. P. No. 1F 2830.     | 2                | 13 42                     |
| 295 Manufacturing bushing for brake pedal of D7. P. No. 8B 3313.      | 2                | 24 22                     |
| 296 Manufacturing of zinc condenser .. ..                             | 48               | 219 81                    |
| 297 Manufacturing foundation bolt and nut ..                          | 4                | 30 38                     |
| 298 Manufacturing bracket as per sample ..                            | 2                | 31 53                     |
| 299 Manufacturing bevel wheel .. ..                                   | 4                | 103 46                    |
| 300 Manufacturing strips for D7. grouser plates.                      | 74               | 447 56                    |
| 301 Manufacturing foundation bolt .. ..                               | 4 Nos.           | 26 41                     |
| 302 Manufacturing oval shaped tube .. ..                              | 4 ..             | 321 98                    |
| 303 Manufacturing exhaust muffler assy for 30K tractor.               | 1 No.            | 57 49                     |
| 304 Manufacturing self starter bushes for jeep 9594.                  | 3 Nos.           | 7 86                      |
| 305 Manufacturing locks for D7. track roller screws P. No. 7B 9457.   | 160              | 36 74                     |
| 306 Manufacturing D4. clutch shaft .. ..                              | 4 Nos.           | 129 15                    |
| 307 Manufacturing shims for D4. idler wheel ..                        | 50 ..            | 24 73                     |
| 308 Manufacturing fuel line pipe with adopter for D4.                 | 1 No.            | 10 72                     |
| 309 Manufacturing of the blade in size 2½" x 2'.                      | 10 Nos.          | ..                        |
| 310 Manufacturing studs as per sample ..                              | 4 ..             | 5 88                      |
| 311 Manufacturing aluminium pattern for clutch pressure plate.        | 1 No.            | 98 69                     |
| 312 Manufacturing bolts as per sample .. ..                           | 4 Nos.           | ..                        |
| 313 Manufacturing and supply of pump flange.                          | 1 No.            | 23 81                     |
|                                                                       | 2,098            | 23,259 79                 |

## APPENDIX No. 21:

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960.*

| Serial number and particulars.<br>(1)                                                                                                                                                     | Quantity.<br>(2) | Amount.<br>(3)<br>RS. RP. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 1 Reconditioning the idler wheel of D7 4T. 3894.                                                                                                                                          | 1 No.            | 61 76                     |
| 2 Reconditioning the idler collar of D7. 4T. 3894.                                                                                                                                        | 2 Nos.           | 66 49                     |
| 3 Reconditioning the clutch yoke .. ..                                                                                                                                                    | ..               | 9 02                      |
| 4 Reconditioning and soldering the radiator of lorry MSC 9551.                                                                                                                            | 1 No.            | 60 02                     |
| 5 Removing tar dirt from the gas house sheets.                                                                                                                                            | ..               | 50 75                     |
| 6 Reconditioning and repairing the exhaust silencer pipe of oil engine No. 141112.                                                                                                        | 1 No.            | 15 45                     |
| 7 Refacing the valves of crossley oil engine No. 141112.                                                                                                                                  | 2 Nos.           | 1 48                      |
| 8 Cutting the teeth in the level gear for the paddy sheller model.                                                                                                                        | 2 ..             | 30 36                     |
| 9 Reconditioning the sprocket hub for D7 ..                                                                                                                                               | ..               | 59 41                     |
| 10 Welding and reconditioning push beam of D7.                                                                                                                                            | 1 No.            | 79 18                     |
| 11 Repairing and reconditioning table vices ..                                                                                                                                            | 2 Nos.           | 20 05                     |
| 12 Reconditioning and welding the worn out portion of the links and base jaws.                                                                                                            | 3 ..             | 128 54                    |
| 13 Refacing the valves R.N. oil engine ..                                                                                                                                                 | 4 ..             | 2 96                      |
| 14 Providing and turning a nipple adppter for fuel tank.                                                                                                                                  | 1 No.            | 6 72                      |
| 15 Welding and reconditioning splines on both ends to the crankshaft of J.D. M.S.L. 164 —1 No.<br>(b) Remetalling the connection rods—2 Nos.<br>(c) Remetalling main bearing sheet—2 nos. | ..               | 214 22                    |
| 16 Reconditioning idler wheel of D7 4T. 3892.                                                                                                                                             | 1 No.            | 58 59                     |
| 17 Reconditioning the single flange roller of D7 3894.                                                                                                                                    | 1 ..             | 28 67                     |
| 18 Reconditioning the carrier roller of D7 3894.                                                                                                                                          | 2 Nos.           | 28 60                     |
| 19 Reconditioning the coil spring holders of D7. 3894.                                                                                                                                    | 1 No.            | 5 73                      |
| 20 Reconditioning the roller collars of D7. 3894.                                                                                                                                         | 2 Nos.           | 60 99                     |
| 21 Reconditioning the carrier roller shaft of D4. 3894.                                                                                                                                   | 2 ..             | 30 91                     |
| 22 Reconditioning the sprocket wheel of D7. 3894.                                                                                                                                         | 1 No.            | 165 16                    |
| 23 Reconditioning the silencer muffler of Van 3808.                                                                                                                                       | 1 ..             | 9 67                      |
| 24 Providing the two oil grooves of the piston of the crossley oil engine 141099.                                                                                                         | 1 ..             | 5 09                      |
| 25 Repairing and checking the clutch in the lawn mover.                                                                                                                                   | 1 ..             | 12 34                     |
| 26 Welding and repairing the printing machine.                                                                                                                                            | 1 ..             | 103 14                    |
| 27 Welding the $\frac{1}{2}$ " coupling with the clamp sent.                                                                                                                              | 1 ..             | 1 77                      |
| 28 Reconditioning the floor board and providing brackets for trail bank of lorry MSC 9638.                                                                                                | 2 Nos.           | 17 80                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                                                    | Quantity.<br>(2) | Amount.<br>(3)<br>RS. RP. |
|--------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 29 (a) Reconditioning the clutch shaft—1 No.<br>(b) Reconditioning the gear box flange—1 No.                             | 2 Nos.           | 9 31                      |
| 30 Removing a foot board for the J.D. MDC 5879.                                                                          | 2 ..             | 129 26                    |
| 31 Reconditioning the tool box of J.D. MDC 5879.                                                                         | 1 No.            | 10 35                     |
| 32 Sharpening and providing letter edges and providing rivets at the place where the handle is jointed for old scissors. | 5 Nos.           | 8 16                      |
| 33 Providing rivets for handle and thickening the bases by welding for new scissors.                                     | 5 ..             | 10 46                     |
| 34 Providing handles for racks .. ..                                                                                     | 7 ..             | 15 21                     |
| 35 Providing handles for digging fork .. ..                                                                              | 1 No.            | 9 28                      |
| 36 Providing handles for bill-hook .. ..                                                                                 | 2 Nos.           | 14 44                     |
| 37 Providing handles for menorties .. ..                                                                                 | 6 ..             | 7 58                      |
| 38 Sharpening the edge of the axes (small) ..                                                                            | 1 No.            | 1 37                      |
| 39 Rectifying the neck and the body of the zinc pot.                                                                     | 1 ..             | 12 96                     |
| 40 Welding the teeth of gear sent of seed drill I.A.R.I. model.                                                          | 1 ..             | 7 75                      |
| 41 Reconditioning the axle of the four wheel trailers.                                                                   | 1 ..             | 109 87                    |
| 42 Providing holes in the idler wheel brounze bushes.                                                                    | 12 Nos.          | 8 78                      |
| 43 Reconditioning sprocket wheel of T.6 tractor.                                                                         | 2 ..             | 72 53                     |
| 44 Welding the starting handle dog of J.D. MDC 5879.                                                                     | 1 No.            | 6 05                      |
| 45 Rivetting the clutch facing in the clutch disc of W. 6 MDC 6775.                                                      | 1 ..             | 23 36                     |
| 46 Extracting the stdn from the ex manifold of W6. 6775                                                                  | 3 Nos.           | 5 23                      |
| 47 Welding a bolt to the support of the radiator of W6. 6775.                                                            | 2 ..             | 6 60                      |
| 48 Removing the leather and spring for new seal and fixing to old seal of W6. 6775.                                      | 1 No.            | 6 60                      |
| 49 Reconditioning the 2B 2725 plug to suit the diameter of the sprocket hub as per instructions.                         | 3 Nos.           | 12 24                     |
| 50 Repairing the jerry cane of D7. 4T. 3894 ..                                                                           | 2 ..             | 27 68                     |
| 51 Reconditioning the seat of J.D. 3879 ..                                                                               | 2 ..             | 70 28                     |
| 52 Reconditioning the cushion seat of D7. 6298.                                                                          | 1 No.            | 41 82                     |
| 53 Reconditioning the seat of D4. tractor ..                                                                             | 2 Nos.           | 69 71                     |
| 54 Reconditioning the radiator and providing a cap for D7. 6298.                                                         | 1 No.            | 61 78                     |
| 55 Reconditioning the size of the P.C.U. cone facing to suit drum.                                                       | ..               | 9 40                      |
| 56 Cleaning the threads of the trunion bearing bolt.                                                                     | 2 Nos.           | 4 08                      |
| 57 Reconditioning the push beam providing new nutto the eye bolt after receiving old nut of D7. 6298.                    | 1 No.            | 96 17                     |
| 58 Reconditioning the showel pulley pin for D7. 6298.                                                                    | 1 ..             | 14 07                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                                    | Quantity.<br>(2) | Amount.<br>(3) |
|----------------------------------------------------------------------------------------------------------|------------------|----------------|
| 59 Rivetting the new lining to the brake band of D7. 6298.                                               | 1 No.            | 4 08           |
| 60 Reconditioning the sprocket wheel of D7. 6298.                                                        | 1 "              | 123 15         |
| 61 Welding petrol tank mouth of D7. 6298 ..                                                              | 1 "              | 10 4           |
| 62 Welding the donnet at cracked places after taking the bend and providing pieces.                      | 1 "              | 13 55          |
| 63 Reconditioning the foot shield of D7. 6298.                                                           | 2 Nos.           | 9 26           |
| 64 Reconditioning the steering lever bad of D7. 6298.                                                    | 1 No.            | 17 38          |
| 65 Turning the hallow stud ball seating the clutch yoke as per sample.                                   | 2 Nos.           | 2 96           |
| 66 Welding the clutch cone for D7. 6298 ..                                                               | 3 "              | 13 49          |
| 67 Providing over size sleeves for clutch yoke returning (7B 5176)                                       | 2 "              | 19 28          |
| 68 Providing lock washers as per sample for D7. 6498 (P.No. 4942).                                       | 2 "              | 11 32          |
| 69 Removing worn out portion from the steering control yoke and providing a fresh one for the same.      | 1 No.            | 3 52           |
| 70 Straightening and fixing the side door stay rods of jeep 4203.                                        | ..               | 9 53           |
| 71 Reconditioning the T.D. 14 idler wheel ..                                                             | 1 No.            |                |
| 72 Reconditioning the TD. 14 sprocket wheel.                                                             | 2 Nos.           | 102 77         |
| 73 Reconditioning the T6. sprocket wheel ..                                                              | 1 No.            |                |
| 74 Repairing and replacing the iron handle to bill hook.                                                 | 1 "              | 2 04           |
| 75 Repairing and fixing the shears with a bolt of garden shear.                                          | 1 "              | 7 27           |
| 76 Replacing the worn out portion in the pair of scrapers.                                               | 1 "              | 2 04           |
| 77 Repairing the open double bullock cart by replacing planks and side angle irons cart No. 14.          | 1 "              | 339 00         |
| 78 Reconditioning and fitting up the dynamo bushes of 20K. 4514.                                         | 1 "              | 6 17           |
| 79 Reconditioning the shaft dynamo key of 20K. 4514.                                                     | 1 "              | 4 08           |
| 80 Reconditioning the dynamo pulley of 20K. 4514.                                                        | 1 "              | 4 70           |
| 81 Reconditioning the fitting up the self starter bushes 20K. 4514.                                      | 2 Nos.           | 12 08          |
| 82 Reconditioning the water pump hub key and seat of 20K. 4514.                                          | 1 No.            | 9 79           |
| 83 Rivetting the idler wheel strips for D7. 3894.                                                        | 2 Nos.           | 32 64          |
| 84 Extracting broken stud portion in the magnets outer and providing suitable stud and nut for MDC 4435. | 1 No.            | 8 16           |
| 85 Cutting the 20 teeth gear in the bevel gear as per sample.                                            | 1 "              | 10 18          |
| 86 Soldering and repairing the radiator of D7. 3872.                                                     | ..               | 30 86          |
| 87 Rivetting P.C.U. brake band of D7. 2590 ..                                                            | 1 No.            | 14 64          |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                      | Quantity.<br>(2) | Amount.<br>(3) |
|--------------------------------------------------------------------------------------------|------------------|----------------|
| 88 Soldering the water bath in the leaky portion.                                          | 1 No.            | 4 89           |
| 89 Reconditioning the tie rods and turning the steel pins of W6. 6775.                     | 1 "              | 16 32          |
| 90 Reconditioning the front axle centre pin of W6. 6775.                                   | 1 "              | 73 68          |
| 91 Reconditioning the clutch pedal shaft and pedal of W6. 6775.                            | 2 Nos.           | 11 23          |
| 92 Reconditioning the welding the drag link of W6. 6775.                                   | 1 No.            | 7 98           |
| 93 Reconditioning the driving seat holder bracket of W6. 6775.                             | 1 "              | 14 76          |
| 94 Welding the broken flange .. .. .                                                       | 1 "              | 5 96           |
| 95 Rectifying the defects in the hand recorder.                                            | 1 "              | 4 10           |
| 96 Repairing and soldering the milk cistern of the cream separator.                        | 1 "              | 6 51           |
| 97 Welding the track roller frame of D7 3894.                                              | 1 "              | 51 40          |
| 98 Reconditioning track roller collars of D7. 3894.                                        | 4 Nos.           | 65 78          |
| 99 Rethreading the strips in the roller frame of D7. 3894.                                 | 2 "              | 8 82           |
| 100 Surfacing fuel transfer pump body of D7. 4180.                                         | 1 set.           | 11 60          |
| 101 Reconditioning the radiator of D7. 3872 ..                                             | 1 No.            | 19 87          |
| 102 Reconditioning the TD. 6 centre blade ..                                               | 1 "              | 70 93          |
| 103 Pan of a chemical balance, removing broken screw and fixing up a new screw of the pan. | 1 "              | 6 34           |
| 104 Reconditioning and repairing the ridger ..                                             | 1 "              | 17 85          |
| 105 Reconditioning and repairing the Japanese interculturators.                            | 4 Nos.           | 19 35          |
| 106 Repairing and soldering the rose cane ..                                               | 1 No.            | 4 71           |
| 107 Welding the crack in the final drive cover of D7. 7126.                                | 1 "              | 46 80          |
| 108 Refacing and turning the valves to suit the Crossley Oil Engine No.                    | 2 Nos.           | 2 96           |
| 109 Reconditioning the crank case of D4. ..                                                | 1 No.            | 39 36          |
| 110 Reconditioning the timing case cover of D4.                                            | 1 "              | 42 12          |
| 111 Reconditioning the oil cooler of D4. ..                                                | 1 "              | 5 23           |
| 112 Reconditioning and removing broken studs in the track roller frame of D4.              | 2 Nos.           | 74 85          |
| 113 Reconditioning the shovel of D4. .. ..                                                 | 1 No.            | 107 46         |
| 114 Providing hooks for hanging the notice board.                                          | 1 "              | 44 70          |
| 115 Reconditioning the cycle stand .. ..                                                   | 2 Nos.           | 65 76          |
| 116 Reconditioning the sprocket wheel of D7. 7126.                                         | 1 No.            | 123 28         |
| 117 Reconditioning the centre blade of D7. 4180.                                           | 1 "              | 108 07         |
| 118 Reconditioning the corner blade of D7. 4180.                                           | 2 Nos.           | 42 38          |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                                     | Quantity.<br>(2) | Amount<br>(3)<br>RS. NP. |
|-----------------------------------------------------------------------------------------------------------|------------------|--------------------------|
| 119 Cleaning the threads in the cylinder back side door and providing a screw as per sample.              | 1 No.            | 12 47                    |
| 120 Reconditioning and providing nuts (1 A 5911) for fuel line assembly of D7. 6298.                      | 2 Nos.           | 10 96                    |
| 121 Cleaning the threads of the nut for the trunion bearing bolt of D7. 6298.                             | 1 No.            | 2 04                     |
| 122 Reconditioning the sprocket hub of D7. 6298                                                           | 2 Nos.           | 31 78                    |
| 123 Reconditioning and providing a cap for the gear box oil inlet mouth of D7. 6298.                      | 1 No.            | 6 71                     |
| 124 Attended to minor repairs to the hood of jeep 4808.                                                   | 1 „              | 9 21                     |
| 125 Drilling and extracting the broken stud from the cylinder head of J.D. 5879.                          | ..               | 20 42                    |
| 126 Reconditioning and repairing the silencer bracket of Van 8618.                                        | ..               | 2 04                     |
| 127 Reconditioning the track roller frame of D. 4 3668.                                                   | 1 No.            | 46 54                    |
| 128 Reconditioning the idler wheels for building up with metal of D4.                                     | 3 Nos.           | 113 86                   |
| 129 Reconditioning and welding the air cleaner of D4.                                                     | 1 No.            | 6 32                     |
| 130 Reconditioning and refacing the valves of D4.                                                         | 8 Nos.           | 4 64                     |
| 131 Reconditioning the transmission cover of D4.                                                          | 1 No.            | 10 55                    |
| 132 Soldering the leakage in oil cooler of D4 ..                                                          | 1 „              | 21 53                    |
| 133 Repairing the wet land trampler .. ..                                                                 | 1 „              | 41 99                    |
| 134 Drilling holes and providing a screw for the silencer of 20K. 4514.                                   | 1 „              | 2 04                     |
| 135 Soldering and sleeve fixing to copper pipe in both ends for the oil line pipe of 20K 4514.            | 2 Nos.           | 8 50                     |
| 136 Soldering and repairing the radiator of John Deere 5879.                                              | 1 No.            | 9 75                     |
| 137 Revetting broken stud in the rear axle hub and rethreading the same of lorry 9612.                    | 1 „              | 8 16                     |
| 138 Cutting and bending the spring as per sample for D7.                                                  | 1 „              | 1 05                     |
| 139 Chipping and cleaning the welded joint in the track frame of D4. 3684.                                | ..               | 12 24                    |
| 140 Reconditioning the sprocket cover of D7.3894                                                          | ..               | 56 75                    |
| 141 Welding the worn out portion in the rear axle assembly at wheel side of lorry 9612.                   | ..               | 9 89                     |
| 142 Soldering the high tension cable wire for 20K.                                                        | 4 Nos.           | 3 71                     |
| 143 Reconditioning the bottom of the fuel bowl glass retainer and elbow unions as per sample of D7. 6298. | 1 No.            | 12 29                    |
| 144 Reconditioning and fixing by flaring the fuel line pipe of 20K. 4514.                                 | 2 Nos.           | 12 09                    |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                               | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|-----------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 145 Reconditioning and welding the water outlet pipe connection of 20K.                             | 1 No.            | 9 20                      |
| 146 Reconditioning and welding the track adjustment spanner of TD 6.                                | 1 „              | 3 75                      |
| 147 Straightening and setting the bend in the steering arm of 20K.                                  | 1 „              | 4 72                      |
| 148 Welding and replacing the body and mud-guard of jeep 4203.                                      | 1 „              | 416 98                    |
| 149 Providing and fitting one bush for the dynamo of jeep 4203.                                     | 1 „              | 2 85                      |
| 150 Reconditioning and supply of lock washers (6B. 4942).                                           | 2 Nos.           | 10 62                     |
| 151 Refacing the fuel transfer pump body of D7 6298.                                                | 1 set.           | 5 27                      |
| 152 Reconditioning and repairing the silencer of W. 6. 6775.                                        | 1 No.            | 16 67                     |
| 153 Repairing the drivers cushion seat of W. 6 ..                                                   | 1 „              | 20 40                     |
| 154 Reconditioning the silencer of D7. 3872 ..                                                      | 1 „              | 12 68                     |
| 155 Reconditioning and rethreading the rear axle studs of lorry 962.                                | ..               | 22 21                     |
| 156 Reconditioning the nut and rethreading the wheel bolt cone.                                     | 2 Nos.           | 6 24                      |
| 157 Fitting and setting alignment of Hobart welding machine.                                        | ..               | 64 20                     |
| 158 Cutting seat and suit sleeves for the valves in the cylinder block of jeep 4203.                | 2 Nos.           | 2 96                      |
| 159 Reconditioning and rethreading the temperature gauge adopter of 20K. 4574.                      | 1 No.            | 3 28                      |
| 160 Reconditioning the track adjusting bolt and nut of D7.                                          | 2 Nos.           | 62 13                     |
| 161 Welding and reconditioning the bracket as per instruction.                                      | 1 No.            | 9 21                      |
| 162 Reduce to undersize the pumpset and polishing of P.S.G. pump No. 5920 and 9908.                 | 2 Nos.           | 13 06                     |
| 163 Reconditioning and turning G.M. bushes to suit the pump shaft of P.S.G. pump No. 5920 and 9908. | 2 „              | 44 89                     |
| 164 Welding the cone strainer into the 4" pipe supplied.                                            | 1 No.            | 3 65                      |
| 165 Welding the chassis frame at roller bracket seating and surface of D4. 3484.                    | 2 Nos.           | 72 87                     |
| 166 Remetalling and turning the connective rods of lorry 9581.                                      | 6 „              | 77 71                     |
| 167 Reconditioning the carrier roller shaft of D7. 6298.                                            | 1 No.            | 16 80                     |
| 168 Reconditioning and repairing the victory plough shares.                                         | 24 Nos.          | 154 51                    |
| 169 Reconditioning and repairing the wet land puddler.                                              | 1 No.            | 35 14                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                             | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|---------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 170 Reconditioning and repairing the victory plough.                                              | 1 Nos.           | 10 10                     |
| 171 Reconditioning and repairing the monsoon plough No. 26.                                       | 1 "              | 17 59                     |
| 172 Welding the bolt hole in the flange of breather bracket of R.N. 5054.                         | 1 "              | 17 55                     |
| 173 Reconditioning and turning the tubrine pump shaft of bore-well No. 42.                        | 1 "              | 11 14                     |
| 174 Draft wheel of junior hoe to be fixed to the junior plough.                                   | 1 "              | 6 47                      |
| 175 Reconditioning and repairing the chain links.                                                 | 4 Nos.           | 23 93                     |
| 176 Reconditioning the idler wheel shaft of D7. 7052.                                             | 1 No.            | 62 18                     |
| 177 Remetalling the connective rods of J.D. MSZ 165.                                              | 2 Nos.           | 62 40                     |
| 178 Extracting the broken stud from the clutch shaft of D4. 3372.                                 | 1 No.            | 4 31                      |
| 179 Extracting the dowel from gear box casing to renew the bearing of D7. 6298.                   | 1 "              | 4 31                      |
| 180 Reconditioning the front idler wheel of TD 14.                                                | 1 "              | 76 00                     |
| 181 Reconditioning the sprocket wheel of T. 6.                                                    | 4 Nos.           | 187 03                    |
| 182 Reconditioning and welding the roller frame of T. 6.                                          | 6 "              | 75 61                     |
| 183 Reconditioning and setting the steering box bush of jeep 4203.                                | 2 "              | 4 31                      |
| 184 Repairing the radiator of TD 9 drill ..                                                       | 1 No.            | 8 38                      |
| 185 Repairing the dart valve boiler of TD 9 drill.                                                | 1 "              | 31 99                     |
| 186 Towing yoke, replacing wooden cross bar and proving hook and refitting.                       | ..               | 54 37                     |
| 187 Mudguard bracket—Welding the broken bracket.                                                  | 1 No.            | 8 62                      |
| 188 Welding and turning to size to fit up the bearing pinion shaft of D7. 6298.                   | 1 "              | 12 75                     |
| 189 Reconditioning and providing a sleeve in the gauge to fit up the bearing of D7-6298.          | 1 "              | 21 32                     |
| 190 Welding and fit up the welded portion to suit 'U' bolt of pump pulley of Crossley Oil Engine. | 1 "              | 12 30                     |
| 191 Replacing the wood and repairing the ride plough.                                             | 2 Nos.           | 21 71                     |
| 192 Welding (a) Silencer muffler (b) stepney wheel bracket.                                       | 3 "              | 23 91                     |
| 193 Welding Mudguard bracket in the jeep 4808.                                                    |                  |                           |
| 194 Reconditioning and welding (U) frame of D4-6841.                                              | 1 No.            | 11 99                     |
| 195 Reconditioning and soldering the radiator assy of D4.                                         | 2 Nos.           | 154 88                    |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                                 | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|-------------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 196 Reconditioning and welding the crank case of D4.                                                  | 4 Nos.           | 168 59                    |
| 197 Reconditioning the spring shackles of D4. ..                                                      | 2 "              | 16 07                     |
| 198 Drilling holes to the steering pump shaft and fitting of D7-6298.                                 | 1 No.            | 4 31                      |
| 199 Reconditioning and gas welding the leaky barrels.                                                 | 5 Nos.           | 5 09                      |
| 200 Repairing and rectify the leak condition of the water cart in tank and painting.                  | 1 No.            | 277 35                    |
| 201 Remetalling the connecting rod bearing and turning to suit the crankshaft of crossley oil engine. | 1 "              | 26 17                     |
| 202 Reconditioning the oil seal collar in cover of crossley oil engine.                               | 1 "              | 5 97                      |
| 203 Soldering the battery terminals and petrol cock of 20K.                                           | 2 Nos.           | 5 01                      |
| 204 Reconditioning and providing adopter for the hydraulic pump pressure tube as per instructions.    | 2 "              | 3 86                      |
| 205 Reconditioning and welding the jerry cane.                                                        | 2 "              | 4 99                      |
| 206 Reconditioning the front idler cross plate of TD 14.                                              | 2 "              | 9 20                      |
| 207 Reconditioning the M.H. Plough land wheel.                                                        | 1 No.            | 46 33                     |
| 208 Reconditioning the centre blade of TD 14 20 holes.                                                | 2 Nos.           | 190 72                    |
| 209 Reconditioning the centre blade of T. 6 24 holes.                                                 | 1 No.            | 78 74                     |
| 210 Reconditioning the corner blades of T 6. ..                                                       | 4 Nos.           | 86 20                     |
| 211 Reconditioning the J.D. hydraulic plough from wheel shaft.                                        | 2 "              | 15 51                     |
| 212 Reconditioning the J.D. Plough clutch housing.                                                    | 1 No.            | 16 83                     |
| 213 Reconditioning the front idler wheel of TD 14.                                                    | 3 Nos.           | 158 41                    |
| 214 Reconditioning and welding the brake band of hand boring set 41.                                  | 4 "              | 4 61                      |
| 215 Removing broken stud in radiators and reconditioning the cover of D4. 3884.                       | 1 No.            | 23 56                     |
| 216 Reconditioning and welding the bell crank levers of D4. bulldozer attachment.                     | 2 Nos.           | 22 34                     |
| 217 Reconditioning the radiator of TD 6 tractor.                                                      | 1 No.            | 156 08                    |
| 218 Polishing the brake drums of TD 6 ..                                                              | 2 Nos.           | 5 09                      |
| 219 Extracting broken studs in the reconditioning spring bed and providing bolt.                      | 1 No.            | 35 30                     |
| 220 Welding and reconditioning the sprocket bearing cage of TD6.                                      | 1 "              | 14 02                     |
| 221 Providing oversize union in the carburator and fixing fuel line of TD6.                           | 1 "              | 5 66                      |
| 222 Brazing the full line pipe of TD 6 .. . . .                                                       | 1 "              | 5 66                      |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                      | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|--------------------------------------------------------------------------------------------|------------------|---------------------------|
| 223 Building by metal in the diagonal brass bearing looking spot of TD 6.                  | 4 Nos.           | 4 61                      |
| 224 Revetting the brake lining in the steering brake band of TD 6.                         | 1 No.            | 14 43                     |
| 225 Reconditioning and repairing the bull rear clutch jaws of DD 10 drill.                 | 1 ..             | 50 77                     |
| 226 Reconditioning and repairing the bull rear clutch of DD 10 drill.                      | 1 ..             | 14 65                     |
| 227 Welding the side door cover of D4. clutch housing.                                     | 1 ..             | 10 51                     |
| 228 Reconditioning the silencer of 20K. 4514 ..                                            | 1 ..             | 24 96                     |
| 229 Repairing the leakage of water in the tank of trailer.                                 | 1 ..             | 50 31                     |
| 230 P.C.U. Power control lift side blocking cover welding.                                 | 1 ..             | 7 48                      |
| 231 Welding the leaky barrels .. .. .                                                      | 5 Nos.           | 9 40                      |
| 232 Providing locks for gear box shaft .. ..                                               | 3 ..             | 4 31                      |
| 233 Repairing and providing self starter bush for lorry MSC 9581.                          | 1 No.            | 12 23                     |
| 234 Reconditioning and providing key as per sample for crossley oil engine governor shaft. | 1 ..             | 13 71                     |
| 235 Reconditioning and providing keys for clutch shaft of TD 9.                            | 2 Nos.           | 12 93                     |
| 236 Repairing and welding the muffler of jeep 4203.                                        | 1 No.            | 29 33                     |
| 237 Reconditioning and welding the turbine pump guide in 42 well.                          | 3 Nos.           | 23 33                     |
| 238 Welding and grinding the cracked portion of governor assembly of crossley oil engine.  | 1 No.            | 10 35                     |
| 239 Repairing the open double bullock cart by replacing the shaft.                         | ..               | 96 37                     |
| 240 Drilling holes to the hour meter cover of D4.                                          | 3 Nos.           | 8 46                      |
| 241 Reconditioning the governor assy of D4.                                                | 1 No.            | 13 55                     |
| 242 Reconditioning the fly wheel and cutting splines in the bore of J.D. 164.              | 1 ..             | 60 09                     |
| 243 Repairing and soldering the radiator of jeep 4203.                                     | 1 ..             | 47 16                     |
| 244 Welding the grooves in the worn out portion of bull real wheel of DD 10 drill.         | 1 ..             | 59 84                     |
| 245 Reconditioning the tie rod ends of W.6 tractor trailer.                                | 1 ..             | 9 97                      |
| 246 Reconditioning the fuel tank filter of D7. 7052.                                       | 1 ..             | 25 64                     |
| 247 Reconditioning the idler wheel collar of D7. 7052.                                     | 1 ..             | 27 36                     |
| 248 Rivetting the lining of P.C.U. cone of D7. 7052.                                       | 1 ..             | 89 68                     |
| 249 Reconditioning the gear shaft of D7. 3894.                                             | 1 ..             | 35 52                     |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                                      | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|------------------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 250 Reconditioning the silencer pipe of D7. 3894.                                                          | 1 No.            | 31 64                     |
| 251 Reconditioning the levers and yoke of D7. 3894.                                                        | 2 Nos.           | 13 51                     |
| 252 Grinding the edges of skid ring of W.6 tractor.                                                        | 4 ..             | 8 62                      |
| 253 Cutting the track link by arc for D7. 5822.                                                            | ..               | 3 91                      |
| 254 Reconditioning and sharpening the edges of the propooring shares.                                      | 3 ..             | 12 64                     |
| 255 Welding the broken brace bolt in the C.P.D.I. Drill derrick at Erode.                                  | ..               | 32 45                     |
| 256 Reconditioning and welding the strips to the grouser plates of D7. 5822.                               | 74 Nos.          | 291 91                    |
| 257 Reconditioning the shovel pin of D7. 5822.                                                             | 1 No.            | 20 28                     |
| 258 Shock absorber :—Reconditioning and replacing new rubber bushes.                                       | 4 Nos.           | 49 52                     |
| 259 Iron wheels :—Welding the broken spocks.                                                               | 1 wheel.         | 46 68                     |
| 260 Head sleeve shaft :—Reconditioning the worn out portion and to suit new sleeve bearing.                | 1 No.            | 87 66                     |
| 261 Spudding pitman connective rods :—Reconditioning the pins and replacing the bushing to suit the shaft. | 2 Nos.           | 9 60                      |
| 262 Bull real shaft bearing :—Replacing the bushing and to suit the shaft.                                 | 2 ..             | 10 10                     |
| 263 Clutch bracket :—Reconditioning and welding the yoke.                                                  | 1 No.            | 10 69                     |
| 264 Draw bar :—Reconditioning the turning bolts and 'U' clamp.                                             | 2 Nos.           | 56 51                     |
| 265 Spudding crank shaft bearing :—Re white metalling the half bearings.                                   | 2 ..             | 5 60                      |
| 266 Spudding sleeve :—Replacing the new bushing and to suit the shaft.                                     | 1 No.            | 11 71                     |
| 267 Reconditioning the muffler of D7. 5822.                                                                | 1 ..             | 55 19                     |
| 268 Fixing and rivetting the brake lining.                                                                 | 1 ..             | 8 62                      |
| 269 Reconditioning the front idler shaft of D7. 7126.                                                      | 1 ..             | 53 67                     |
| 270 Cutting the collars for the master pin of D7.                                                          | 1 ..             | 10 23                     |
| 271 Removing the broken stud from the oil collar of D7.                                                    | 1 ..             | 10 23                     |
| 272 Reconditioning the spool cup for 32 disc harrow plough.                                                | 1 ..             | 2 96                      |
| 273 Reconditioning and welding the clutch fingers of D4.                                                   | 4 Nos.           | 7 89                      |
| 274 Reconditioning and welding the clutch yoke and refacing the side of D4. 3484.                          | 1 No.            | 12 72                     |
| 275 Welding and turning the collar of clutch of D4.                                                        | 1 ..             | 7 89                      |
| 276 Reconditioning the gear pin of fuel transfer pump of D7.                                               | 1 ..             | 1 48                      |



## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                         | Quantity.<br>(2) | Amount.<br>(3) |
|-----------------------------------------------------------------------------------------------|------------------|----------------|
|                                                                                               |                  | RS. P.         |
| 277 Reconditioning the cornerblades of D7. 4180.                                              | 2 Nos.           | 33 31          |
| 278 Drilling 5/8" holes to the M.S. Channel to fix the wick set.                              | 4 "              | 8 62           |
| 279 Rivetting the lining of the bracket band of D7.                                           | 1 No.            | 8 62           |
| 280 Reconditioning the idler wheel of D7. 3872.                                               | 1 "              | 15 81          |
| 281 Soldering the container of the snap sack sprayer.                                         | 2 Nos.           | 18 14          |
| 282 Cutting the centre blade to suit the shovel of D7. 2590.                                  | 1 No.            | 5 02           |
| 283 Cutting the centre blade to suit the shovel of D7-2590.                                   | 1 "              | 5 02           |
| 284 Reconditioning the single flange roller of D6. tractor.                                   | 2 Nos.           | 41 34          |
| 285 Reconditioning the double flange roller of D6.                                            | 3 "              | 79 74          |
| 286 Reconditioning the double flange roller of TD 14.                                         | 1 No.            | 30 43          |
| 287 Reconditioning the single flange roller of T6.                                            | 1 "              | 29 63          |
| 288 Reconditioning the idler wheel of D6.                                                     | 1 "              | 35 88          |
| 289 Welding the track adjusting spanner of D7.                                                | 1 "              | 7 63           |
| 290 Reducing the diameter of gudgeon pin to suit the piston of R.N. engine                    | 1 "              | 19 37          |
| 291 Providing and fitting rainforce support with bearing to power chaff cutter cutting shaft. | ..               | 51 45          |
| 292 Welding the chais of D7. 3894                                                             | ..               | 49 99          |
| 293 Soldering the air cleaner of D7. 3872                                                     | 1 "              | 10 01          |
| 294 Reconditioning the radiator cap of D7. 3872.                                              | 1 "              | 11 32          |
| 295 Reconditioning bush and the shaft pin of clutch pedal of lorry MSC 9616.                  | 1 "              | 5 24           |
| 296 Reconditioning and sharpening the edges of the pruning shears.                            | 3 Nos.           | 2 16           |
| 297 Drilling holes for mounting 1/2" pipe in the 4" G.I. pipes.                               | 7 "              | 8 62           |
| 298 Providing clamp and fixing to the silencer pipe of Van MSY 3808.                          | 1 No.            | 4 31           |
| 299 Cleaning the threads in idler wheel by putting the 3/8" tap of D7. 3872.                  | 1 "              | 4 31           |
| 300 Reconditioning the gear rod of D7. 7058                                                   | 1 "              | 4 31           |
| 301 Welding the rings into the pipes supplied for the stafe.                                  | 4 Nos.           | 5 89           |
| 302 Painting the oil cooler of D7. 5822                                                       | 1 No.            | 3 64           |
| 303 Welding the broken part in the pump set of well 76.                                       | 1 "              | 17 84          |
| 304 Reconditioning the collar and clutch pedal shaft of TD 6.                                 | 2 Nos.           | 23 37          |

## APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                   | Quantity.<br>(2)       | Amount.<br>(3) |
|-----------------------------------------------------------------------------------------|------------------------|----------------|
|                                                                                         |                        | RS. P.         |
| 305 Central farm cart painting.—Aluminium and green paints single bullock cart.         | 1 No.                  | 88 29          |
| 306 Metal shaft.—Bender assembling .. ..                                                | 1 "                    | 24 98          |
| 307 Fitting stepney wheel bracket for jeep 5048.                                        | 1 "                    | 10 24          |
| 308 Welding the M.S. angle posts and straightening the bends.                           | 60 Nos.                | 122 94         |
| 309 Repairing the iron racks and welding iron cross bars.                               | 1 No.                  | 27 81          |
| 310 Welding and fixing the fuel tank bracket of crossley oil engine 141099.             | 1 "                    | 8 95           |
| 311 Reconditioning and providing a bush to water pump bearing seating of jeep MSZ 4203. | 1 "                    | 10 18          |
| 312 Reconditioning the adjustment bolt and nut of dozer shovel of D4. 3484.             | 1 set of }<br>2 Nos. } | 10 83          |
| 313 Reconditioning and welding the silencer of D7. 2590.                                | 1 No.                  | 4 41           |
| 314 Chipping and grinding sprocket seal shield of D7.                                   | 2 Nos.                 | 20 33          |
| 315 Soldering the holder wire of quasi arc welding cable.                               | 1 No.                  | 3 37           |
| 316 Repairing and checking the oil pump circulator of milling machine.                  | ..                     | 17 87          |
| 317 Welding the leaky barrels .. ..                                                     | 15 Nos.                | 15 89          |
| 318 Reconditioning the radiator of D7. 3872                                             | 1 No.                  | 49 66          |
| 319 Single bullock cart.—Painting green, yellow and aluminium colour and other repairs. | 1 "                    | 41 92          |
| 320 Double bullock cart.—Painting aluminium and yellow colours and other repairs.       | 1 "                    | 72 12          |
| 321 Double bullock cart.—Painting aluminium and cream colour and other repairs.         | 1 "                    | 47 98          |
| 322 Reconditioning the bonnet of D7. 5822                                               | 1 "                    | 39 72          |
| 323 Reconditioning the radiator cap of D7. 5822.                                        | 1 "                    | 8 62           |
| 324 Reconditioning the holder assembly and band of D7. 5822.                            | 1 "                    | 15 12          |
| 325 Reconditioning and soldering the radiator of lorry Che. MSC 9638.                   | 1 "                    | 13 96          |
| 326 Remetalling and turning the connective rod bearing of crossley oil engine 141132.   | 1 "                    | 33 87          |
| 327 Welding the chains in gas tank No. 2 in the gas house.                              | ..                     | 5 61           |
| 328 Repairing and welding the corner angle of the iron gate.                            | 1 "                    | 9 36           |
| 329 Reconditioning the idler wheel of D7. 5822.                                         | 1 "                    | 82 99          |
| 330 Reconditioning the sprocket wheel of D7. 5822.                                      | 1 "                    | 146 32         |
| 331 Reconditioning the pulley block of D7. 5822.                                        | 1 "                    | 4 89           |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                                                             | Quantity.<br>(2) | Amount.<br>(3) |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------|----------------|
|                                                                                                                                   |                  | RS. NP.        |
| 332 Reconditioning the radiator of D7. 5822 ..                                                                                    | 1 No.            | 36 74          |
| 333 Studding up metal in the sprocket wheel of D7. 2590.                                                                          | 1 ..             | 65 30          |
| 334 Reconditioning the starting mechanism of the starting handle of D7. 2590.                                                     | 1 ..             | 8 62           |
| 335 Providing C. I. Valve seat inserts for cylinder head and reconditioning the seat and grinding of for valve D4. 3663 and 3583. | ..               | 55 44          |
| 336 Reconditioning the bell crank line of D4. 7039 and 6841.                                                                      | 3 Nos.           | 35 83          |
| 337 Reconditioning the lubrication filter body of D4. 3673.                                                                       | 1 No.            | 18 12          |
| 338 Reconditioning the main spring bolts of D4. 7039.                                                                             | 2 Nos.           | 22 26          |
| 339 Removing broken studs and welding the track roller frame of D4. 3673.                                                         | 1 No.            | 7 40           |
| 340 Reconditioning the bell crank of D4. 6841.                                                                                    | 1 ..             | 15 91          |
| 341 Reconditioning bush beam of D4. 3671 ..                                                                                       | 1 ..             | 10 40          |
| 342 Reconditioning the water pump body of D4. 3663.                                                                               | 1 ..             | 14 66          |
| 343 Reconditioning the exhaust muffler pipe of D4. 3553 and 3663.                                                                 | 2 Nos.           | 57 86          |
| 344 Reconditioning the corner blades of D7. 3872.                                                                                 | 2 ..             | 106 16         |
| 345 Reconditioning and brazing the leakage in the fuel tank of compressor.                                                        | 1 No.            | 7 23           |
| 346 Cleaning the threads of gear housing bearing trunion of D7. 6298.                                                             | 1 ..             | 4 31           |
| 347 Reconditioning the adjusting lever of P.C.U. of D7. 3872.                                                                     | 1 ..             | 8 62           |
| 348 Welding the water cooling flange of lister blackstone oil engine 10763.                                                       | 1 ..             | 14 29          |
| 349 Welding the air cleaner stariner of lister blackstone oil engine 10763.                                                       | 1 ..             | 6 08           |
| 350 Reconditioning the master pin No. 5F. 3357 for D4. 3484.                                                                      | 1 ..             | 7 27           |
| 351 Reconditioning the clutch shaft of D7.                                                                                        | 1 ..             | 8 62           |
| 352 Repairing the radiator of drill DD9 ..                                                                                        | 1 ..             | 29 61          |
| 353 Rivetting the P.C.U. cone segments with lining for D7. 4180.                                                                  | 1 ..             | 135 83         |
| 354 Reconditioning the collar in crank shaft seal of crossley oil engine No. 141132.                                              | 1 ..             | 13 92          |
| 355 Reconditioning and welding the broken part of fuel pump and of crossley oil engine 141132.                                    | 1 ..             | 9 05           |
| 356 Reconditioning and cutting transmission covers of D4.                                                                         | 2 Nos.           | 18 61          |
| 357 Repairing the radiator and soldering the leaking portion of D4.                                                               | 1 ..             | 66 53          |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                            | Quantity.<br>(2) | Amount.<br>(3) |
|--------------------------------------------------------------------------------------------------|------------------|----------------|
|                                                                                                  |                  | RS. NP.        |
| 358 Cylinder head valve inserting and grinding of D4.                                            | 1 No.            | 15 33          |
| 359 Reconditioning the 'U' frame of D4. ..                                                       | 1 ..             | 18 23          |
| 360 Reconditioning hydraulic pump operating lever of D4.                                         | 1 ..             | 29 93          |
| 361 Reconditioning operating rod of D4. ..                                                       | 1 ..             | 12 93          |
| 362 Reconditioning the gear shaft fork of D4.                                                    | 2 Nos.           | 5 79           |
| 363 Reconditioning and repairing the fuel line pipe of D4.                                       | 3 ..             | 36 18          |
| 364 Cleaning and cutting the threads for the pump shaft of oil engine 6036.                      | 1 No.            | 6 46           |
| 365 Repairing the body of jeep 729 .. ..                                                         | 1 ..             | 1 23           |
| 366 Repairing the starter switch of stanley lathe.                                               | ..               | 12 06          |
| 367 Providing 'U' clamp in $\frac{3}{8}$ " M.S. rod for Mech deering plough.                     | 1 ..             | 9 76           |
| 368 Welding the pump pulley in worn out portion of well No. 40.                                  | 2 Nos.           | 6 07           |
| 369 Repairing the spare radiator of lorry M.S.C. 9638.                                           | 1 No.            | 94 07          |
| 370 Reconditioning the silencer pipe of jeep 4203.                                               | 2 Nos.           | 45 63          |
| 371 Reconditioning the silencer pipe of jeep 4203.                                               | 1 No.            | 16 25          |
| 372 Welding and setright the broken flange of the pumpset of well No. 76.                        | 1 ..             | 13 20          |
| 373 Welding the 2 $\frac{1}{2}$ " pipe and 2" pipe pieces together joint in the water main pipe. | 1 ..             | 3 41           |
| 374 Reconditioning the share of 8/142 genius Mec. deering plough.                                | 1 ..             | 23 41          |
| 375 Reconditioning the share point of 8/142 genius mec. deering plough.                          | 2 Nos.           | 9 34           |
| 376 Repairing the body and driver seat of the passenger cart and repairing the blue col. us.     | 1 No.            | 76 06          |
| 378 Reducing the head sizes of the bolt for TD 6.                                                | 6 Nos.           | 4 31           |
| 379 Welding the broken flange pipe of Raniwater pump.                                            | ..               | 1 94           |
| 380 Reconditioning the idler wheel of D4. 3482 ..                                                | 2 Nos.           | 93 85          |
| 381 Reconditioning the carrier roller of D4. 3482.                                               | 1 No.            | 17 50          |
| 382 Welding the track pins with bushes of tractor chain D7. 5822.                                | ..               | 23 80          |
| 383 Cutting and reconditioning the transmission cover of D4. 3482.                               | 1 No.            | 11 02          |
| 384 Welding and reconditioning hood assembly of D7. 3894                                         | 1 ..             | 12 80          |
| 385 Extracting the broken stud from radiator top cover of D7. 3894.                              | 1 ..             | 5 68           |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                           | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|-------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 386 Reconditioning the carrier roller washers of D4. 3482.                                      | 1 No.            | 4 31                      |
| 387 Removing the broken studs in roller frame of D4. 3482.                                      | ..               | 13 53                     |
| 388 Reconditioning and providing valve seat inserts to 30K. engine block.                       | ..               | 8 75                      |
| 389 Beamer to suit the connecting rod bushes and drilling holes to strating engine of D7. 3926. | ..               | 4 31                      |
| 390 Reconditioning the double flange rollers of D4. 3482.                                       | 4 Nos.           | 26 67                     |
| 391 Reconditioning the single flange roller of D4. 3482.                                        | 4 ..             | 36 36                     |
| 392 Reconditioning the exhaust pipe clamp of D4 3484.                                           | 1 No.            | 5 91                      |
| 393 Reconditioning the hydraulic cylinder plate washer of D4. 3484.                             | 6 Nos.           | 17 62                     |
| 394 Reconditioning the bellows seal assembly of D7. 5822.                                       | 1 No.            | 5 09                      |
| 395 Cutting the edges of the links in the track chain of D7. 5822.                              | 1 chain.         | 16 94                     |
| 396 Removing and cutting the bolts from the track chain of D7. 4180.                            | 1 No.            | 25 56                     |
| 397 Soldering the leak portion in the sprayer lance.                                            | 1 ..             | 2 09                      |
| 398 Reconditioning and welding the handle ..                                                    | ..               | 7 64                      |
| 399 Reconditioning and welding the engine rear bead 'L' clamp of lorry Chev. MSC 9581.          | 2 Nos.           | 3 11                      |
| 400 Repairs in basin castor and Narmadah reaper.                                                | ..               | 16 13                     |
| 401 Reconditioning TD 9 front idler shaft ..                                                    | 2 Nos.           | 14 98                     |
| 402 Reconditioning T. 6 idler shaft .. ..                                                       | 2 ..             | 14 28                     |
| 403 Reconditioning T. 6 roller shaft .. ..                                                      | 4 ..             | 39 96                     |
| 404 Reconditioning the Burmese lathe .. ..                                                      | ..               | 122 95                    |
| 405 Reconditioning the clutch housing of disc plough.                                           | ..               | 39 03                     |
| 406 Reconditioning and welding the clutch of harrow wheel.                                      | 9 Nos.           | 876 11                    |
| 407 Reconditioning the grouser plates of D7. tractor.                                           | ..               | 15 79                     |
| 408 Repairing the double bullock cart and bottom planks.                                        | 1 No.            | 95 12                     |
| 409 Reconditioning star bowl assy. of D6.                                                       | 1 ..             | 307 48                    |
| 410 Reconditioning and rethreading the sprocket wheel hub of D7.                                | 1 ..             | 61 61                     |
| 411 Reconditioning the idler shaft of D7 ..                                                     | 2 Nos.           | 75 59                     |
| 412 Reconditioning track frame by welding and extracting broken stud rivetting the strips.      | 2 ..             | 161 51                    |
| 413 Reconditioning idler collar of D7 .. ..                                                     | 4 ..             | 30 26                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                         | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|-----------------------------------------------------------------------------------------------|------------------|---------------------------|
| 414 Reconditioning idler wheel of D7 ..                                                       | 2 Nos.           | 52 37                     |
| 415 Remetalling the connecting rod bearing for J.D.                                           | 2 ..             | 26 03                     |
| 416 Reconditioning H. disc plough clutch box of J.D.                                          | ..               | 25 02                     |
| 417 Reconditioning the chais side arm .. ..                                                   | 1 No.            | 42 86                     |
| 418 Reconditioning the A. frame of D7 5822 ..                                                 | 2 Nos.           | 73 85                     |
| 419 Roller collers of D6. P. No. 6B. 9383 ..                                                  | 5 ..             | 24 76                     |
| 420 Reconditioning D6. roller collers P. No. 6B. 9384.                                        | 5 ..             | 19 86                     |
| 421 Reconditioning front idler wheel of T. 6 ..                                               | 1 No.            | 33 78                     |
| 422 Reconditioning the front idler wheel shaft of T. 6.                                       | 3 Nos.           | 44 29                     |
| 423 Reconditioning clutch wheel of mecanic deering plough spokes to be welded.                | 1 No.            | 9 14                      |
| 424 Reconditioning and welding the clutch wheel 9 disc.                                       | 4 Nos.           | 208 72                    |
| 425 Reconditioning the sprocket carrier of T. 6.                                              | 1 No.            | 10 10                     |
| 426 Reconditioning the sprocket drive gear out bearing cage.                                  | 3 Nos.           | 15 41                     |
| 427 Reconditioning the track spring retainer rear of T. 6.                                    | 1 No.            | 13 61                     |
| 428 Reconditioning the track frame guide roller bracket of T. 6.                              | 1 No.            | 5 68                      |
| 429 Repairing and reconditioning the shares of the monsoonplough.                             | 23 Nos.          | 81 01                     |
| 430 Repairing the water tank trailer, etc. ..                                                 | ..               | 146 28                    |
| 431 Reconditioning the back seats and seat fitting of D4.                                     | 3 Nos.           | 4 18                      |
| 432 Repairing and reconditioning the 4 wheel trailers body and storing arm.                   | 1 No.            | 427 63                    |
| 433 Reconditioning the front idler shafts ..                                                  | ..               | 120 01                    |
| 434 Reconditioning the track roller shafts of D7.                                             | ..               | 83 72                     |
| 435 Remetalling the connecting rod bearings and main bearing of 30K.                          | 7 sets.          | 38 62                     |
| 436 Reconditioning and cutting teeth to the rear axle of D6 tractor.                          | 2 Nos.           | 115 23                    |
| 437 Reconditioning and cutting teeth to the reduction gears.                                  | 2 ..             | 18 93                     |
| 438 Reconditioning the radiator and soldering ..                                              | 1 No.            | 67 16                     |
| 439 Reconditioning the sprocket wheel of D7 ..                                                | 2 Nos.           | 86 51                     |
| 440 Reconditioning the idler wheel of D7 ..                                                   | 2 ..             | 1 37                      |
| 441 Reconditioning the carrier roller of D7 ..                                                | 4 ..             | 22 89                     |
| 442 Reconditioning and providing two holes in the existing crown 1 sleeve pin of DD drill 17. | 2 ..             | 30 65                     |
| 443 Cutting the 4" pipes at the required length and drilling the holes.                       | 10 ..            | 35 85                     |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                             | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. NP. |
|---------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 444 Refacing the hub and providing spacers $\frac{1}{4}$ " and $\frac{1}{8}$ " thin for D7. 8078. | 1 No.            | 52 04                     |
| 445 Removing the gear and refixing in fuel transfer pump shaft of D7. 6298.                       | 1 "              | 5 79                      |
| 446 Reconditioning the final drive cover of D7. 6298.                                             | 1 set.           | 44 52                     |
| 447 Reconditioning the shovel of D7. 4T. 2491.                                                    | 1 No.            | 71 38                     |
| 448 Reconditioning the 'U' frame of D7. 4T. 2491.                                                 | 1 "              | 51 60                     |
| 449 Building and turning the worn out portion of P.T.O. clutch shaft and nut of drill PD 9.       | 1 "              | 41 34                     |
| 450 Examining and repairing the radiator of drill.                                                | 1 "              | 26 34                     |
| 451 Filling turning the grooves of clutch centre of drill PD 9.                                   | 1 "              | 4 31                      |
| 452 Reconditioning and welding the fuel oil filter collar of Drill PD 9.                          | 1 "              | 8 62                      |
| 453 Soldering the neck of the sprayer .. ..                                                       | 1 "              | 17                        |
| 454 Reconditioning and providing a dummy plug to the cylinder head of van MSY 3808.               | 1 "              | 5 79                      |
| 455 Welding the track rollers of TD 6. 20968 ..                                                   | 10 Nos.          | 157 57                    |
| 456 Reconditioning and welding the idler wheel of TD 6. 20968.                                    | 2 "              | 92 43                     |
| 457 Reconditioning and welding the carrier roller of TD 6. 20968.                                 | 4 "              | 11 89                     |
| 458 Removing the broken stud from idler guide of TD 6. 20968.                                     | 2 "              | 8 24                      |
| 459 Reconditioning the latch housing assembly of D7. 7126.                                        | 1 No.            | 8 62                      |
| 460 Welding the land axle shaft of M.H. 3 furrow plough.                                          | 1 "              | 21 01                     |
| 461 Reconditioning and providing rollers for clutch rod of M.H. plough.                           | 1 "              | 11 58                     |
| 462 Welding repairing and soldering the selvi sprayers.                                           | 7 Nos.           | 27 37                     |
| 463 Filling holes to the disc of the M.H. 503 plough.                                             | 1 No.            | 4 31                      |
| 464 Facing drum coupling flange reducing thickness to $\frac{1}{4}$ " of D7. 5822.                | 1 "              | 6 46                      |
| 465 Reconditioning and cleaning the threads of coupling shaft of D7. 5822.                        | 1 "              | 5 48                      |
| 466 Repairing the exhaust silencer pipe of Van 3808.                                              | 1 "              | 32 64                     |
| 467 Repairing the dial switches of hobart welding set.                                            | 1 "              | ..                        |
| 468 Reconditioning the silencer and trill pipe of lorry 9551.                                     | 1 "              | 31 04                     |
| 469 Welding the share point dowel of fordson major 4435.                                          | 1 "              | 2 74                      |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                                             | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. NP. |
|-------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 470 Stritching the top hood tarpauline of 4T. 2491.                                                               | 1 No.            | 12 00                     |
| 471 Refacing the hydraulic pump body of D7. 4T. 2491.                                                             | 1 "              | 9 58                      |
| 472 Reconditioning and repairing the silencer of lorry 9638.                                                      | 1 "              | 7 33                      |
| 473 Enlarging the fuel tank bed bolts holes and rethreading the same.                                             | 1 "              | 14 30                     |
| 474 Reconditioning the radiator cap of D7. 4T. 3894.                                                              | 1 "              | 9 97                      |
| 475 Soldering the H.T. cable to the clips of 3894.                                                                | 1 "              | 5 66                      |
| 476 Built up the worn out portion of links by welding of drilling jaws.                                           | 2 Nos.           | 39 91                     |
| 477 Welding the turning the clutch gears hub of 2491.                                                             | 1 No.            | 11 61                     |
| 478 Modifying the pump bed and engine mounting and refitting as per instructions of lister blackstone oil engine. | ..               | 21 26                     |
| 479 Repairing the radiator of jeep MDE 1231 ..                                                                    | 1 No.            | 6 39                      |
| 480 Rivetting the brake linking the brake band of 2491.                                                           | 1 "              | 11 58                     |
| 481 Rivetting the lining in the P. C. U. cone of 2491.                                                            | 1 "              | 121 66                    |
| 482 Reconditioning the front idler wheel of D6.                                                                   | 3 Nos.           | 168 75                    |
| 483 Reconditioning the idler guide of D6 ..                                                                       | 4 "              | 64 87                     |
| 484 Reconditioning the turnion bearing pieces of D6.                                                              | 2 "              | 13 58                     |
| 485 Reconditioning the diagonal track frame of D6.                                                                | 2 "              | 134 50                    |
| 486 Racing either side of the sprocket hub nut.                                                                   | 1 No.            | 5 09                      |
| 487 Welding the roller bearing caste to retain the rollers of D7. 6238.                                           | 2 Nos.           | 5 66                      |
| 488 Welding a lengthy bolt to the brake band yolk of D7. 5822.                                                    | 1 No.            | 10 55                     |
| 489 Polishing the crankshaft journal of oil engine 141043.                                                        | 1 "              | 12 93                     |
| 490 Remetalling the cont. rod bearing and to suit the crank pin of oil engine 141043.                             | 1 "              | 24 76                     |
| 491 Reconditioning the small end bush to suit the gudgeon pin of oil engine 141043.                               | 1 "              | 23 21                     |
| 492 Extracting the broken studs from the fly wheel side and providing threads of oil engine 141043.               | 2 Nos.           | 12 93                     |
| 493 Repairing the radiator of D4. 3484.                                                                           | 1 No.            | 100 38                    |
| 494 Body patch up work for the lorry MSC 9581.                                                                    | ..               | 79 79                     |
| 495 Reconditioning the bolts heads of D4. 3482.                                                                   | 20 Nos.          | 9 99                      |
| 496 Reconditioning the idler wheel shaft of D7. 8078.                                                             | 2 "              | 124 53                    |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                          | Quantity.<br>(2) | Amount<br>(3)<br>Rs. P. |
|--------------------------------------------------------------------------------|------------------|-------------------------|
| 497 Reconditioning the idler collar of D7. 7088.                               | 4 Nos.           | 98 88                   |
| 498 Reconditioning the carrier roller shaft of D7. 8078.                       | 4 ..             | 67 56                   |
| 499 Repairing the broken pruning shears with handles.                          | 2 ..             | 12 93                   |
| 500 Repairing the night soil cart.                                             | 1 No.            | 69 24                   |
| 501 Rivetting the brake lining of sand reel of drill DD. 17.                   | 1 ..             | 11 34                   |
| 502 Reconditioning the lock washers of D7. 6293 (6B. 8357).                    | 4 Nos.           | 2 92                    |
| 503 Welding the track rollers of D7. 7M. 6298.                                 | 7 ..             | 32 04                   |
| 504 Reconditioning the turning the axle bolts of lorry 9616.                   | 12 ..            | 26 38                   |
| 505 Turning the rollers and pins for same turn.                                | 20 ..            | 47 90                   |
| 506 Reconditioning and repairing the seals of D4. 6U. 3482.                    | 2 ..             | 7 03                    |
| 507 Soldering the filter oil cup of D7. 4T. 2491.                              | 1 No.            | 11 47                   |
| 508 Reconditioning the idler wheel of D7. 4180.                                | 1 ..             | 86 25                   |
| 509 Reconditioning the idler wheel collar of D7. 4180.                         | 1 ..             | 86 25                   |
| 510 Turning the unions to suit the bowel assy as per instructions of D7. 4180. | 1 ..             | 7 25                    |
| 511 Extracting the broken stud from air cleaner bracket of D7. 4180.           | 1 ..             | 4 31                    |
| 512 Reconditioning the idler wheel shaft of D7. 4180.                          | 1 ..             | 31 33                   |
| 513 Soldering petrol tank of lorry 9581.                                       | 1 ..             | 13 20                   |
| 514 Rethreading the hole in air cleaner manifold and retaining rod of 3872.    | 1 ..             | 4 20                    |
| 515 Drilling hole and rethreading in chasis of D7. 3926.                       | ..               | 24 51                   |
| 516 Welding the pipe piece with the clamp for hostel pipe line.                | 1 No.            | 3 55                    |
| 517 Soldering the fuel line pipe and throttle cable of drill DD.6.             | 2 Nos.           | 4 18                    |
| 518 Reconditioning the silencer of jeep MSZ 4203.                              | 1 No.            | 7 16                    |
| 519 Reconditioning the cushion seat providing springs.                         | 1 ..             | 50 76                   |
| 520 Reconditioning and welding the crankcase of D4. 6842.                      | 1 ..             | 40 06                   |
| 521 Reconditioning the bell crank of D4. 6842.                                 | 1 ..             | 7 96                    |
| 522 Rethreading band reconditioning the main springbolt of D4. 6842.           | 2 Nos.           | 9 20                    |
| 523 Rethreading strips to the grouser plates and welding of D7. 4T. 2491.      | 74 Nos.          | 594 18                  |
| 524 Reconditioning the idler wheel of D7. 4T. 2491.                            | 2 Nos.           | 81 90                   |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                           | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. P. |
|-------------------------------------------------------------------------------------------------|------------------|--------------------------|
| 525 Reconditioning the radiator front wire gauge by providing a new wire gauge of D7. 4T. 3894. | 1 No.            | 21 20                    |
| 526 Reconditioning the gear box main shaft of D7. 4T. 3894.                                     | 2 Nos.           | 90 95                    |
| 527 Providing strips and welding to the grouser plates of D7. 4T. 4180.                         | 74 Nos.          | 933 31                   |
| 528 Removing bolts from grouser plates of D7. 4180.                                             | 1 set.           | 46 17                    |
| 529 Reconditioning and erasing the oil filter of D4. 3484.                                      | 1 No.            | 5 69                     |
| 530 Welding the water drum inner key portion.                                                   | 1 ..             | 15 05                    |
| 531 Cutting the lid and welding the pipe in the handle.                                         | 2 Nos.           | 6 33                     |
| 532 Soldering and repairing the radiator of bus 9718.                                           | 1 No.            | 61 34                    |
| 533 Reconditioning the share adjustment bolt for mec. deering 8/142 genius plough.              | 2 Nos.           | 18 55                    |
| 534 Reconditioning the share adjustment holder for mec. deering genius plough.                  | 1 No.            | 48 10                    |
| 535 Reconditioning the radiator of D4. tractor.                                                 | 1 ..             | 83 34                    |
| 536 Reconditioning the bell crank links of D4. tractors.                                        | 2 Nos.           | 15 58                    |
| 537 Reconditioning and removing broken threads in track roller frame of D4. 3663.               | 2 ..             | 63 26                    |
| 538 Welding the broken side arms and replacing bushes for roller frame side arms of D4 3551.    | 2 ..             | 24 73                    |
| 539 Reconditioning and welding the leaky barrels.                                               | 15 ..            | 13 24                    |
| 540 Reconditioning and providing bush for self starter motor of jeep MSY 4808.                  | 1 No.            | 5 20                     |
| 541 Cutting and threading the 3" pipe of well No. 68.                                           | 1 ..             | 4 31                     |
| 542 Welding the broken angle iron support in step of the single bullock cart.                   | 1 ..             | 9 17                     |
| 543 C.D.B. Cart No. 16.—Welding the broken angle iron portion in front of the shaft.            | 1 ..             | 9 17                     |
| 544 Victory plough—welding and reconditioning iron support to the broken shaft of plough.       | 1 ..             | ..                       |
| 545 Disc plough—providing collars and set right the wheels.                                     | 2 Nos.           | 10 63                    |
| 546 Leaving board—Reconditioning and replacing broken parts.                                    | 1 No.            | 6 62                     |
| 547 Reconditioning and repairing the junior hoe.                                                | 1 ..             | 8 62                     |
| 548 Welding the victory plough chains ..                                                        | 3 Nos.           | 5 25                     |
| 549 Reconditioning and repairing the bill hooks.                                                | 5 ..             | 18 65                    |
| 550 Cutting and setting the spring leaf to ..                                                   | ..               | 17 32                    |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. P. |
|--------------------------------------------------------------------------------------|------------------|--------------------------|
| 551 Reconditioning the radiator of D7. 4T. 3872.                                     | 1 No.            | 128 39                   |
| 552 Broken stud in chasis body of D4. 3482. ..                                       | ..               | 9 59                     |
| 553 Welding the stephney bracket of jeep MDE 729.                                    | ..               | 3 41                     |
| 554 Enlarging bore in the idler flange of D7. 4T. 2491.                              | 2 Nos.           | 9 40                     |
| 555 Removing broken studs in clutch real centre and providing new studs.             | 1 No.            | 11 72                    |
| 556 Reconditioning and welding the lifting dog in cracked portion.                   | 4 Nos.           | 18 25                    |
| 557 Body patch up work in bus MDC 9718 and floor board and body repairs, etc.        | 1 No.            | 132 99                   |
| 558 Reconditioning the carrier roller shaft of D7. 4T. 2491.                         | 4 Nos.           | 60 34                    |
| 559 Removing bend in front axle support of J.D. tractor A.40 and providing bushes.   | 2 ..             | 43 14                    |
| 560 Turning the seed drill plate .. .. .                                             | 2 ..             | 2 55                     |
| 561 Turning the axle to suit the wheels for C.E. 10F 6076.                           | 2 ..             | 5 09                     |
| 562 Reconditioning the clutch shaft bushes of D4. 3482.                              | 2 ..             | 32 37                    |
| 563 Reconditioning the clutch shaft of D4. 3482.                                     | 1 No.            | 13 32                    |
| 564 Reconditioning the track adjusting bolt and nut of D7. 5822.                     | 1 ..             | 13 48                    |
| 565 Welding and patch up the bonnet of lorry 9551.                                   | ..               | 6 76                     |
| 566 Revetting the brake band lining for D7. 7M. 7052.                                | 1 No.            | 8 62                     |
| 567 Repairing the J. D. silencer muffler A 40 tractor.                               | 1 ..             | 7 21                     |
| 568 Milling (cutting gear) to wheel .. ..                                            | 4 Nos.           | 55 00                    |
| 569 Enlarging the size of the bore in the clutch box of mec. deering seed drill.     | 1 No.            | 5 09                     |
| 570 Reconditioning the steering drop arm bush and pinion race of bus MDC 9718.       | 1 ..             | 8 55                     |
| 571 Welding the coupling of the coil filter point.                                   | 1 ..             | 6 05                     |
| 572 Welding the belly plate of D7. 4T. 3926 ..                                       | 1 ..             | 19 51                    |
| 573 Providing hooks for seat and welding the plate in drive pinion of jeep MSZ 5048. | 4 Nos.           | 6 39                     |
| 574 Welding the land wheel shaft of the mec. deering plough.                         | 1 No.            | 8 49                     |
| 575 Reconditioning the arm bolts and nuts of hydraulic press.                        | 2 Nos.           | 18 14                    |
| 576 Rethreading the heavy chisel .. .. .                                             | 2 ..             | 10 18                    |
| 577 Oversizing the coupling flange of the 5 H.P. electric motor of the plastic pump. | 1 No.            | 2 55                     |
| 578 Reconditioning the radiator of D4 .. ..                                          | 1 No.            | 69 79                    |
| 579 Reconditioning the TD 14 sprocket wheel ..                                       | 2 Nos.           | 199 04                   |
| 580 Repairs to T6 radiator .. .. .                                                   | 1 No.            | 161 43                   |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                          | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. P. |
|------------------------------------------------------------------------------------------------|------------------|--------------------------|
| 581 Welding track shoe bolts heads .. ..                                                       | 300 Nos.         | 81 86                    |
| 582 Turning $\frac{1}{2}$ " shafts to suit the bearing supplied.                               | 2 Nos.           | 3 18                     |
| 583 Welding the two 3" pipes together .. ..                                                    | 1 No.            | 2 33                     |
| 584 D. 6 roller frame.—Removing broken studs and rivetting strips and retapping all the holes. | 2 Nos.           | 56 79                    |
| 585 Repairing horn ring of MSY. 3308 .. ..                                                     | 1 No.            | 3 31                     |
| 586 Threading 3" dia pipes at both ends .. ..                                                  | 2 Nos.           | 2 16                     |
| 587 Reconditioning the metal pad .. .. .                                                       | 1 No.            | 5 19                     |
| 588 Cutting 3 holes in C. D. 3 drills chasis ..                                                | 1 ..             | 4 21                     |
| 589 Cutting 'U' grove 6 dia pulley as per sample.                                              | 1 ..             | 4 21                     |
| 590 Fly wheel.—Broken studs 3 Nos. removing and rethreading cap screws.                        | 1 ..             | 5 93                     |
| 591 Drilling engine bel (channel) and cutting slots.                                           | 2 Nos.           | 19 43                    |
| 592 Grinding wheel reboring to 1 $\frac{1}{2}$ " size .. ..                                    | 2 ..             | 4 31                     |
| 593 Belly plate .. .. .                                                                        | 1 No.            | 53 09                    |
| 594 Reconditioning and drilling holes as per sample.                                           | 2 Nos.           | 8 01                     |
| 595 Drilling $\frac{1}{2}$ " dia hole in four places in 2 $\frac{1}{2}$ " dia pipe.            | 1 No.            | 1 08                     |
| 596 Reconditioning the floor board of lorry MSC 9612.                                          | 1 ..             | 38 92                    |
| 597 Welding the expand connections in gas welding.                                             | 1 ..             | 3 53                     |
| 598 Bell crank lever.—welding and turning ..                                                   | 2 Nos.           | 13 36                    |
| 599 D. F. rollers of D6.—Reconditioning by gas welding.                                        | 4 ..             | 100 23                   |
| 600 Reconditioning centre blades of D6 .. ..                                                   | 3 ..             | 336 01                   |
| 601 Reconditioning carrier roller .. .. .                                                      | 1 No.            | 12 09                    |
| 602 Reconditioning carrier roller (of D6) shaft with bracket.                                  | 1 ..             | 13 86                    |
| 603 Reconditioning sprocket wheel of D6 .. ..                                                  | 1 ..             | 124 76                   |
| 604 Reconditioning single flange roller of D6 ..                                               | 2 Nos.           | 33 61                    |
| 605 Reconditioning clutch yoke of D6 .. ..                                                     | 1 No.            | 9 75                     |
| 606 Rassey harris cam shaft .. .. .                                                            | 1 ..             | 13 39                    |
| 607 Track roller collars of D6 .. .. .                                                         | 5 Nos.           | 18 02                    |
| 608 Corner blades of D6 .. .. .                                                                | 4 ..             | 81 69                    |
| 609 Providing clamps for oil tank .. .. .                                                      | 2 ..             | 51 16                    |
| 610 Single bullock cart.—Axle bend straightening and wheel rectifying.                         | 1 No.            | 21 38                    |
| 611 Fusing the track chain bolts head to remove grouser plates from D7. 4T. 4180 chain.        | 1 ..             | 10 27                    |
| 612 Reconditioning D7 carrier roller shaft ..                                                  | 4 Nos.           | 83 24                    |
| 613 Welding oil engine trailer .. .. .                                                         | 1 No.            | 8 51                     |

## APPENDIX No- 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                                                  | Quantity.<br>(2) | Amount.<br>(3) |
|------------------------------------------------------------------------------------------------------------------------|------------------|----------------|
|                                                                                                                        |                  | RS. RP.        |
| 614 Cutting gears as per sample .. .. .                                                                                | 3 Nos.           | 22 00          |
| 615 Reconditioning the chain frame of D7. 4T. 3894.                                                                    | 1 No.            | 105 32         |
| 616 Reconditioning shims (small 8 and big 8) ..                                                                        | 16 Nos.          | 8 62           |
| 617 Reconditioning steering lever bushes .. ..                                                                         | 1 No.            | 19 04          |
| 618 Cutting transmission cover .. .. .                                                                                 | 1 ..             | 5 08           |
| 619 Boring gear shaft 10½ dia pulley .. .. .                                                                           | 2 Nos.           | 3 82           |
| 620 Sharpening pruning shears .. .. .                                                                                  | 3 ..             | 4 31           |
| 621 Reconditioning master pin of D7. 7M. 5922.                                                                         | 1 No.            | 7 86           |
| 622 Cutting robots of anclon assembly of lorry MSC 9581.                                                               | 1 ..             | 2 16           |
| 623 Reconditioning, P. D. 9 drill steam engine shaft turning, cutting key way, reconditioning key, removing fly wheel. | 1 ..             | 60 53          |
| 624 Double bullock cart .. .. .                                                                                        | 1 ..             | 71 16          |
| 625 Reconditioning the collar and remounting the bearing and turning of crossley oil engine 141043.                    | 1 ..             | 17 97          |
| 626 Reconditioning clutch box levers of seed drill.                                                                    | 1 ..             | 14 27          |
| 627 Cutting gears of seed drill model .. .. .                                                                          | 1 set.           | 4 13           |
| 628 Turn lathe block cutting to 3/16" depth of PD 9.                                                                   | 1 No.            | 17 24          |
| 629 Soldering distilled water plant .. .. .                                                                            | 1 ..             | 2 83           |
| 630 Welding tack roller frame .. .. .                                                                                  | 1 ..             | 83 18          |
| 631 Reconditioning brake nut and bolt .. .. .                                                                          | 1 ..             | 5 22           |
| 632 Removing broken stud in carburetor body.                                                                           | 1 ..             | 2 16           |
| 633 Remove broken stud from brake drum of lorry 9612.                                                                  | 1 ..             | 8 62           |
| 634 Reconditioning the heel shaft of drill P.D.9.                                                                      | 1 ..             | 52 65          |
| 635 Welding the decompressor lever of O. E. 10F 6162.                                                                  | 1 ..             | 3 53           |
| 636 Reconditioning and repairing the fuel filter union thread.                                                         | 1 ..             | 8 24           |
| 637 Reconditioning radiator and soldering of lorry MSZ 2419.                                                           | 1 ..             | 42 74          |
| 638 Repairing the body and back door of lorry MSC 2419.                                                                | ..               | 138 32         |
| 639 Reconditioning spudding chisel and bit ..                                                                          | 2 Nos.           | 208 28         |
| 640 Reconditioning axle plate of lorry MSC 9612.                                                                       | 1 No.            | 15 62          |
| 641 Reconditioning key of college library ..                                                                           | 2 Nos.           | 19 56          |
| 642 Repairing the stanley lathe .. .. .                                                                                | ..               | 43 06          |
| 643 Removing bend and welding the draw bar of M.H.3. disc. plough.                                                     | 1 No.            | 9 98           |
| 644 Body repairs and patch up work lorry MSC. 9612.                                                                    | 1 ..             | 166 83         |
| 645 Reconditioning D4. seat .. .. .                                                                                    | 1 set.           | 80 82          |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                            | Quantity.<br>(2) | Amount.<br>(3) |
|----------------------------------------------------------------------------------|------------------|----------------|
|                                                                                  |                  | RS. RP.        |
| 646 Turning anchor and shackle pin bushes lorry 9612.                            | 12 Nos.          | 94 20          |
| 647 Removing bend in the bumper of lorry MSC 9612.                               | 1 No.            | 6 55           |
| 648 Reconditioning and removing stud and welding of D4. track roller frame.      | 1 ..             | 21 79          |
| 649 Reconditioning crank case of D4. tractor ..                                  | 1 ..             | 21 82          |
| 650 Rethreading the cylinder head of studs of D7. 8078.                          | ..               | 21 55          |
| 651 Reconditioning clutch adjustment lever and clamp of D7. 4180.                | 2 Nos.           | 26 44          |
| 652 Reconditioning the fuel jet in carburettor of 40 A. J.D. tractor.            | 1 No.            | 5 39           |
| 653 Providing C 5/8" M.S. rod valve key rod at 3' 6" x length.                   | 1 ..             | 21 61          |
| 654 Replacing the bottom plank of the tool box.                                  | 1 ..             | 34 85          |
| 655 Reconditioning the fly wheel lock washers of lorry 9612.                     | 3 Nos.           | 9 14           |
| 656 Reconditioning the seat of lorry 9612 ..                                     | 4 ..             | 66 08          |
| 657 Rebuilt hand brake cable plug in gear box and providing stud for lorry 9612. | ..               | 18 93          |
| 658 Welding the jar .. .. .                                                      | 1 No.            | 5 30           |
| 659 Repairing the worn out shaft of O.D.B. cart 15.                              | 1 ..             | 16 72          |
| 660 Welding the brass flats .. .. .                                              | 2 Nos.           | 6 90           |
| 661 Soldering the gas roles and reducing the burners.                            | 25 ..            | 14 56          |
| 662 Repairing and charging belt for grinding machine.                            | 1 No.            | 95 75          |
| 663 Soldering the radiators of jeep MSZ 4203 ..                                  | 1 ..             | 12 16          |
| 664 Reconditioning the gear box yoke of lorry 9612.                              | 1 ..             | 19 84          |
| 665 Removing bend in magnets rotor shaft of D4.                                  | 1 ..             | 9 91           |
| 666 Reconditioning the pinion latch shaft of D7. 8078.                           | 1 ..             | 8 62           |
| 667 Inserting rollers in the carrier roller shaft of D7. 8078.                   | 4 Nos.           | 6 86           |
| 668 Reconditioning the clutch nut of D7. 8075.                                   | 1 No.            | 10 28          |
| 669 Reduce and polish pump shaft of R. N. 10 F 162.                              | 1 ..             | 6 86           |
| 670 Drilling dowel holes in cylinder head of D7. 8078.                           | 2 Nos.           | 4 31           |
| 671 Reconditioning the master pin of D7. 7M. 6298.                               | 2 ..             | 27 83          |
| 672 Repairing the handle of the tiffin carrier ..                                | 1 No.            | 7 22           |
| 673 Reconditioning and repairing the silencer of lorry 9612.                     | 1 ..             | 18 40          |
| 674 Pruning scissors—Replacing handle ..                                         | 1 ..             | 7 68           |

## APPENDIX No. 21—cont.

*List of reconditioned articles, at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                     | Quantity.<br>(2) | Amount.<br>(3)<br>rs. nP. |
|-------------------------------------------------------------------------------------------|------------------|---------------------------|
| 675 Garden fork—welding at broken side                                                    | 2 Nos.           | 9 34                      |
| 676 Wheel barrow welding the iron rim of the front wheel.                                 | 1 No.            | 14 48                     |
| 677 Reconditioning the clutch lever rod of D4. 3484.                                      | 1 ..             | 13 51                     |
| 678 Reconditioning coupling hole and key of D4. 3484.                                     | 2 Nos.           | 10 00                     |
| 679 Reconditioning the brake adjusting bolt and nut D7. 7052.                             | 2 ..             | 21 48                     |
| 680 Welding and reconditioning the starting handle of D7. 7052.                           | 1 No.            | 8 62                      |
| 681 Reconditioning the oil pipe and providing a piece of J.D. MDZ. 165.                   | 1 ..             | 6 23                      |
| 682 Reconditioning H.M. guntakka plough plates                                            | 4 Nos.           | 27 04                     |
| 683 Providing a oil groove in contr. rod of J.D. 165.                                     | 2 ..             | 6 47                      |
| 684 Fitting and setting the grinding wheel to 'Matra' crankshaft grinder.                 | 1 No.            | 7 47                      |
| 685 Fitting the steering shaft and bushing in the housing of D7. 4180.                    | 1 set            | 25 71                     |
| 686 Reconditioning and cut spring leafs of lorry 9612.                                    | 4 Nos.           | 5 01                      |
| 687 Repairing and soldering the lance of the sprayer.                                     | 1 No.            | 5 86                      |
| 688 Soldering the mouth of the since cones                                                | 4 Nos.           | 16 00                     |
| 689 Welding the mudguard of the lorry 9594                                                | 1 side           | 2 71                      |
| 690 Turn to size the drive pinion collar and repairing the silencer of lorry 9616.        | ..               | 18 22                     |
| 691 Grinding the D4. crankshaft 30 U.S. contr. rod and 50 W.S. main journal.              | 1 No.            | 53 55                     |
| 692 Building up metal in the roller shaft and to suit the bush of D7. 4T. 3872.           | 7 Nos.           | 185 40                    |
| 693 Turning the bushes to O/S to suit the suit shaft of D7. 3872.                         | 14 Nos.          | 24 33                     |
| 694 Reconditioning the track rollers of D7.4T. 3872.                                      | 4 ..             | 109 06                    |
| 695 Reconditioning the idler wheel and extracting broken stud in the same of D7.4T. 3872. | 1 No.            | 83 78                     |
| 696 Reconditioning and cutting splines to decompressor lever of oil engine No. 10763.     | 2 Nos.           | 2 76                      |
| 697 Reconditioning and turning the clutch pins of P.D.7. drill.                           | 2 ..             | 4 56                      |
| 698 Rebuilt and rethreading the worn out portion of hoist survival of C.P.III. Drill.     | No.              | 16 86                     |
| 699 Reconditioning the 'U' frame centre bolt of D7. 7052.                                 | 1 ..             | 39 18                     |
| 700 Reconditioning the clutch pins and throttle stud of lorry 9612.                       | 2 Nos.           | 15 32                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                              | Quantity.<br>(2) | Amount.<br>(3)<br>rs. nP. |
|------------------------------------------------------------------------------------|------------------|---------------------------|
| 701 Welding and reconditioning the spring leaf of D4. 6U. 3482.                    | 1 No.            | 8 05                      |
| 702 Servicing and checking the matra crankshaft grinder.                           |                  | 11 78                     |
| 703 Reconditioning the oil line pipe of lorry 9612.                                | 1 No.            | 9 62                      |
| 704 Solder and repairing the side tube of steam oven.                              | 1 ..             | 12 24                     |
| 705 Providing brass union to suit the bowl assembly body of D7. 8078.              | 1 ..             | 12 40                     |
| 706 Reconditioning the gear know of Jeep MSZ 5048.                                 | 1 ..             | 4 31                      |
| 707 Soldering the petrol tank of Jeep MSZ 5048.                                    | 1 ..             | 16 96                     |
| 708 Reconditioning the 'A' frame adjustment bolt and nut of D7. 7052.              | 1 ..             | 68 54                     |
| 709 Reconditioning the bulldozer shovel centre pin of D7. 7052.                    | 1 ..             | 11 43                     |
| 710 Soldering the leaky portion in 4 gallon tins.                                  | 2 Nos.           | 8 69                      |
| 711 Cutting the piston ring grooves to suit the piston ring grooves of oil engine. | 1 No.            | 5 09                      |
| 712 Repairing and replacing the bottom of the still copper.                        | 1 ..             | 224 72                    |
| 713 Reconditioning the centre blade of D7. 8078.                                   | 1 ..             | 162 78                    |
| 714 Reconditioning the corner blades of D7. 8078.                                  | 2 Nos.           | 48 60                     |
| 715 D.B. Cart.—Reconditioning and connecting the beam with bolt and tight.         | 1 No.            | 25 81                     |
| 716 Reconditioning the rear wheel axle key of 20K.M.H. 4517.                       | 1 ..             | 43 00                     |
| 717 Reconditioning and repairing the radiator of D4. 3553.                         | 1 ..             | 100 05                    |
| 718 Reconditioning the corner blades of D4. tractor.                               | 16 Nos.          | 132 94                    |
| 719 Soldering and welding the petrol cane mouth and seat of W.6. tractor.          | 1 No.            | 6 96                      |
| 720 Reconditioning the idler wheel of D7. 7126.                                    | 1 ..             | 77 85                     |
| 721 Welding the oil drums with pieces of pipes used as C.H. tank.                  | 3 Nos.           | 106 27                    |
| 722 Reconditioning the T.6 corner blades.                                          | 5 ..             | 72 10                     |
| 723 Soldering the radiator of john deer tractor 5879.                              | 1 No.            | 12 90                     |
| 724 Reconditioning the disc yoke assembly                                          | 1 ..             | 10 18                     |
| 725 Welding the draw bar of the 2 wheel trailer of J.D. tractor.                   | 1 ..             | 8 44                      |
| 726 Build up worn out oil seal portion in rear axle of lorry 9633.                 | 1 ..             | 16 26                     |
| 727 Rivetting the brake lining in the clutch disc of D7. 6298.                     | 1 ..             | 4 31                      |



## APPENDIX No. 21—cont.

*List of reconditined articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                                                       | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. & P. |
|-----------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|
| 728 Cleaning the threads and providing lock washers of clutch shaft of D7. 6298.                                            | 1 No.            | 4 31                       |
| 729 Repairing the lance of the sprayer in leak portion.                                                                     | 1 ..             | 2 16                       |
| 730 Soldering the radiator at leaky portion of DD7 engine.                                                                  | 1 ..             | 15 70                      |
| 731 Rethreading and suit the nut to ball pin of lorry 9612.                                                                 | 1 ..             | 2 08                       |
| 732 Providing grease nipple adapters for idler wheel of D7. 3872.                                                           | 4 Nos.           | 5 65                       |
| 733 Welding the draw bar to suit the pin ..                                                                                 | 1 No.            | 7 13                       |
| 734 Soldering the spraying lawner ..                                                                                        | 1 ..             | 4 59                       |
| 735 Soldering the radiator of D7. 5822 ..                                                                                   | 1 ..             | 54 66                      |
| 736 Removing the nuts from the broken recoil spring bolt (std).                                                             | 1 ..<br>(2 nuts) | 8 63                       |
| 737 Pruning shears—Sharpening and replacing centre balls.                                                                   | 2 Nos.           | 3 08                       |
| 738 Cutting wheel bolts of John Deere ..                                                                                    | 3 ..             | 3 79                       |
| 739 Repairs to solinoid switch—Soldering wires of Soldering the top plate of D7. drill.                                     | 1 No.            | 5 66                       |
| 740 Idler wheel plates reboring the required size.                                                                          | 4 Nos.           | 3 24                       |
| 741 Providing steel bottom in the latch assembly and lock washers for the same and putting holes in 4 bolts D.7. 7.M. 6298. | 1 ..             | 10 70                      |
| 742 Reconditioning the front bumper of lorry MSC 9551.                                                                      | 1 ..             | 3 16                       |
| 743 Reconditioning the silencer of jeep MSP 1809.                                                                           | 1 ..             | 3 45                       |
| 744 Reconditioning light brackets and floor board, etc., of lorry 9612.                                                     | 1 No.            | 8 62                       |
| 745 Remetalling lining in the P.C.U. Cone of D.7. 7.M. 6298.                                                                | 1 ..             | 17 24                      |
| 746 Dial frame welding the cracked portion in the frame.                                                                    | 1 ..             | 5 11                       |
| 747 Reconditioning the eye bolt of D 7. 5822 ..                                                                             | 2 Nos.           | 14 49                      |
| 748 Repairing the water tank and trailer (Total)                                                                            | 11 ..            | 18 80                      |
| 749 Reconditioning and welding the barrels ..                                                                               | 10 ..            | 9 12                       |
| 750 Reconditioning the back seats and seat sitting of D.H.                                                                  | 3 ..             | 48 77                      |
| 751 Reconditioning the front idler shafts of D7.                                                                            | 6 ..             | 181 89                     |
| 752 Reconditioning and repairing the 4 wheel trailer body and steering arm, etc.                                            | 1 No.            | 139 78                     |
| 753 Reconditioning the track roller shaft of D7.                                                                            | 15 Nos.          | 52 80                      |
| 754 Remetalling the cont. rod bearings and main bearing of 30K. M.H. MDU 382.                                               | 7 set.           | 10 18                      |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                                                              | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. & P. |
|--------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|
| 755 Reconditioning and cutting teeth to the rear axle of D.B. tractor MDO. 1656, and providing sleeve to the axle. | 2 Nos.           | 40 80                      |
| 756 Reconditioning and cutting teeth to the reduction gears of tractor MDO. 1656.                                  | 2 ..             | 69 19                      |
| 757 Repairing the steel measuring tape ..                                                                          | 1 No.            | 8 62                       |
| 758 Reconditioning the radiator and soldering ..                                                                   | 1 ..             | 26 99                      |
| 759 Replacing hose for knap sack sprayer of sanitary section.                                                      | 1 ..             | 26 09                      |
| 760 Reconditioning the sprocket wheel of D7. 8078.                                                                 | 2 Nos.           | 101 72                     |
| 761 Reconditioning the idler wheel of D7. 8078.                                                                    | 2 ..             | 191 82                     |
| 762 Reconditioning the carrier roller of D7. 8078.                                                                 | 4 ..             | 20 67                      |
| 763 Reconditioning front idler guide ..                                                                            | 2 ..             | 44 94                      |
| 764 Reconditioning T.6 front idler guide ..                                                                        | 2 ..             | 11 30                      |
| 765 Reconditioning of double bullock cart ..                                                                       | 1 No.            | 309 47                     |
| 766 Roller frame with side arm—Removing broken bolt welding worn out portion.                                      | 1 ..             | 22 50                      |
| 767 H.P. Gas tank No. 3 welding at Gas house ..                                                                    | 1 ..             | 296 13                     |
| 768 Cutting and supply of field labels ..                                                                          | 300 Nos.         | 4 20                       |
| 769 Reconditioning side arm of D.4 tractor ..                                                                      | 1 No.            | 8 23                       |
| 770 Reconditioning the track adjusting screw and nut of D7. 6298.                                                  | 2 Nos.           | 59 43                      |
| 771 Reconditioning the roller rollers of D7. 3872.                                                                 | 12 ..            | 109 13                     |
| 772 Diesel tank, providing drain plug and tool box of D4.                                                          | ..               | 15 79                      |
| 773 Welding D.7 roller to join with rollers hub                                                                    | 3 Nos.           | 15 05                      |
| 774 Reconditioning the pin of DD 10 drill ..                                                                       | 1 No.            | 2 45                       |
| 775 Cutting the track of D7 by gas welding ..                                                                      | 1 ..             | 2 45                       |
| 776 Reconditioning the John deer 5 disc plough clutch operating lever.                                             | 2 Nos.           | 5 83                       |
| 777 Reconditioning the fuel transfer pump ..                                                                       | 1 No.            | 8 15                       |
| 778 Reconditioning the transfer pump gear shaft asy.                                                               | 1 ..             | 13 03                      |
| 779 Reconditioning the corner blade for D7. 4.T. 3894.                                                             | 2 Nos.           | 43 58                      |
| 780 Providing sleeve for box spanner D7. 7.M. 6298.                                                                | 1 No.            | 7 80                       |
| 781 Reconditioning the wheel barrow ..                                                                             | 1 ..             | 61 75                      |
| 782 Reconditioning a frame bolt and nut of D7. 7126.                                                               | 2 Nos.           | 192 27                     |
| 783 Welding the doors of lorry MSC 9612 ..                                                                         | 1 No.            | 17 66                      |
| 784 Soldering the brace and the rod ..                                                                             | 1 ..             | 1 00                       |
| 785 Fusing chemical compound ..                                                                                    | 1 ..             | 34 16                      |
| 786 Welding D7. crank case ..                                                                                      | 1 ..             | 48 28                      |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                                                     | Quantity.<br>(2) | Amount.<br>(3)<br>rs. & p. |
|-----------------------------------------------------------------------------------------------------------|------------------|----------------------------|
| 787 Coating metal on grouser plate of D7. 7M. 7126.                                                       | 1 set.           | 99 93                      |
| 788 Reconditioning the master pin with collars.                                                           | 6                | 5 06                       |
| 789 Remetalling the pitman leaving .. ..                                                                  | 1 set.           | 32 06                      |
| 790 Grinding of crankshaft of D8 series and tractor.                                                      | 1 No.            | 69 15                      |
| 791 Rivetting the lining in the P.C.U. Cone ..                                                            | 1 ..             | 10 70                      |
| 792 Reconditioning the water pump of lorry MSC 9512.                                                      | 1 ..             | 19 88                      |
| 793 Cutting the key way in the motor pulley ..                                                            | 1 ..             | 1 38                       |
| 794 Modifying the sprocket wheel rim alignment.                                                           | ..               | 156 06                     |
| 795 Welding the cups of hand operated distributor.                                                        | 2 Nos.           | 5 03                       |
| 796 Repairing the handle of generator motor of 3rd unit of gas house.                                     | 1 No.            | 2 83                       |
| 797 Removing broken studs from the rear wheel drums of lorry MSC 9581.                                    | 10               | 62 81                      |
| 798 Providing collars for master pin as per sample.                                                       | 6                | 37 31                      |
| 799 Reconditioning the circular saw of the mech. section.                                                 | 1                | 8 58                       |
| 800 Building up metal in idler wheel of D7 3872.                                                          | 1                | 90 73                      |
| 801 Fusing and removing bolt heads in track chain of D7 3882.                                             | 1 set.           | 42 51                      |
| 802 Rivetting the P.C.U. Brake band lining of D7. 4180.                                                   | 1 No.            | 11 55                      |
| 803 Rivetting the P.C.U. segments for cone of D7 4180.                                                    | 1                | 7 20                       |
| 804 Cutting the teeth in given blocks ..                                                                  | 4 Nos.           | 16 50                      |
| 805 Reconditioning the track adjusting bolt and nut of D7. 3894.                                          | 2                | 56 31                      |
| 806 Removing the spring and guide pin from steering driven of D7. 4822.                                   | ..               | 11 32                      |
| 807 Repairing the power hacksaw machine ..                                                                | 1                | 8 02                       |
| 808 Reconditioning the track adjusting bolt and nut of D7. 3972.                                          | 2 sets.          | 87 79                      |
| 809 Reconditioning the shackle pin bushes of lorry MSC 9551.                                              | ..               | 63 98                      |
| 810 Reconditioning and welding the crank case in the cracked position of air compressor of Dorman engine. | 1                | 71 07                      |
| 811 Repairing the wooden frame supporting of washing in bacteriology lab.                                 | 1                | 317 54                     |
| 812 Welding the track rollers of D7. 3872 ..                                                              | 10               | 145 68                     |
| 813 Welding the carrier rollers of D7. 3872 ..                                                            | 4                | 47 68                      |
| 814 Reconditioning and welding the rollers frame of D7. 3872.                                             | 1                | 10 66                      |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                          | Quantity.<br>(2) | Amount.<br>(3)<br>rs. & p. |
|--------------------------------------------------------------------------------|------------------|----------------------------|
| 815 Providing strips for D7 grouser plates ..                                  | 1 set.           | 540 49                     |
| 816 Reconditioning the D6. D.F. rollers ..                                     | 4                | 52 31                      |
| 817 Reconditioning the D6. S.F. rollers ..                                     | 5 Nos.           | 128 18                     |
| 818 Reconditioning the D4. S.F. rollers ..                                     | 1                | 22 47                      |
| 819 Reconditioning the T6. crankshaft ..                                       | 1                | 38 50                      |
| 820 Reconditioning the cutting ridge centre of D4.                             | 1                | 49 38                      |
| 821 Reconditioning the cutting ridge centre of D6.                             | 1                | 59 16                      |
| 822 Reconditioning the sprayer of D6 ..                                        | 1                | 21 00                      |
| 823 Reconditioning the gate valves .. ..                                       | 2                | 58 61                      |
| 824 Enlarging the bore of track rollers to suit shaft.                         | 6                | 10 20                      |
| 825 Reconditioning the gear shaft shaft of D7. 3926.                           | 1                | 12 45                      |
| 826 Reconditioning and brazing the funnel of D. 7126.                          | 1                | 4 16                       |
| 827 Reconditioning track adjusting spanner to suit size.                       | 1                | 4 17                       |
| 828 Rivetting the brake band P.C.U. lining of D7. 7126.                        | 1                | 4 31                       |
| 829 Welding the bonnet of D7. 3894 .. ..                                       | 1                | 14 86                      |
| 830 Rivetting the brake lining of D7. 3894 ..                                  | 1                | 4 31                       |
| 831 Reconditioning track adjusting screw of D7. 7126.                          | 1                | 7 69                       |
| 832 Reconditioning the rod to suit the box spanner of D 7. 3894.               | 1                | 8 62                       |
| 833 Providing bushes for the clutch links of D 7. 3894.                        | 25               | 15 02                      |
| 834 Turning the armature shaft and providing bush for same of M.H. 20 tractor. | 1                | 7 99                       |
| 835 Reconditioning the governor shaft and bushing of vulken engine.            | 1                | 9 25                       |
| 836 Soldering the radiator of Jeep MSZ 4293 ..                                 | 1                | 33 28                      |
| 837 Repairing and replacing wire rope for sliding cutter.                      | 1                | 32 55                      |
| 838 Reconditioning the radiator of D 7. 3926 ..                                | 1                | 93 12                      |
| 839 Reconditioning the track roller shaft of D 7. 3872.                        | 3                | 130 94                     |
| 840 Welding the exhaust manifold of J.D. tractor.                              | 2                | 35 71                      |
| 841 Grinding the spring and turning to suit the guide of D 7. 6298.            | 1                | 4 43                       |
| 842 Reconditioning the radiator of D 7. 3822 ..                                | 1                | 37 54                      |
| 843 Reconditioning the water pump bracket of D7.                               | 1                | 6 09                       |
| 844 Straightening and removing bend in fan blade of D 7.                       | 1                | 14 48                      |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                     | Quantity.<br>(2) | Amount.<br>(3)<br>RS. RP. |
|---------------------------------------------------------------------------|------------------|---------------------------|
| 845 Repairing the lid of auto clock .. ..                                 | 1                | 5 66                      |
| 846 Rebuilding and setting the cont rods of lister belt stone oil engine. | 2                | 24 98                     |
| 847 Repairing the clutch of crank shaft grinder.                          | 1                | 23 56                     |
| 848 Cutting and welding the old sprocket hub with new sprocket.           | 2                | 24 96                     |
| 849 Reconditioning the oil seal of vakesa engine governor.                | 1                | 11 32                     |
| 850 Repairing the fitting the spare sent in lorry MSC 9581.               | 2                | 9 48                      |
| 851 Remetalling the con rod bearing of Chief tractor.                     | 1                | 12 78                     |
| 852 Reconditioning the petrol stock cock of lorry MSC 9581.               | 1                | 10 59                     |
| 853 Reconditioning and removing bend in draw bar of J.D. plough.          | 1                | 27 64                     |
| 854 Welding the chasis of D7. 5822 .. ..                                  | 1                | 28 52                     |
| 855 Reconditioning the carrier roller of D7. 2491.                        | 1                | 12 75                     |
| 856 Reconditioning the track adjusting bolt and nut.                      | 2                | 12 48                     |
| 857 Reconditioning the crank case of D4 ..                                | 2                | 69 05                     |
| 858 Reconditioning the bell crank lever of D4 ..                          | 1                | 3 86                      |
| 859 Reconditioning the chasis of D4 .. ..                                 | 1                | 72 25                     |
| 860 Body patch-up work for lorry MSC 9551 ..                              | 1                | 148 74                    |
| 861 Reconditioning the corner blades of D7. 4T. 2491.                     | 2                | 98 20                     |
| 862 Extracting broken studs in diagonal brace of D7.                      | 1                | 21 55                     |
| 863 Reconditioning the corner blades of D7. 8078.                         | 2                | 51 40                     |
| 864 Repairing the wheel valve of sprayer ..                               | 1                | 9 32                      |
| 865 Reconditioning and welding broken iron angle in open D.B. carts.      | 2                | 76 99                     |
| 866 Patch-up and repairing sugarcane boring pans.                         | 2                | 42 60                     |
| 867 Repairing and soldering the radiator of jeep MSZ 4203.                | 1                | 63 50                     |
| 868 Reconditioning the water pump bush of bus MDC 9718.                   | 1                | 1 36                      |
| 869 Reconditioning and lock the bearing nut of brake drum plate.          | 2                | 4 55                      |
| 870 Reconditioning the roll shafts of D4 ..                               | 2                | 92 28                     |
| 871 Reconditioning the welling the crank case of D4.                      | 1                | 30 40                     |
| 872 Reconditioning and inserting valve seats for DD 6 drill engine.       | 1                | 13 83                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                       | Quantity.<br>(2) | Amount.<br>(3)<br>RS. RP. |
|-----------------------------------------------------------------------------|------------------|---------------------------|
| 873 Reconditioning and the broken shaft of D7. 4T. 3926.                    | 4                | 16 50                     |
| 874 Reconditioning the steam oven .. ..                                     | 1                | 74 08                     |
| 875 Repairing the shaping machine .. ..                                     | 2                | 43 73                     |
| 876 Reconditioning the main spring of the lorry MSC 9638.                   | 1 set.           | 13 92                     |
| 877 Reconditioning the treading the chisels ..                              | 5                | 51 27                     |
| 878 Reconditioning and welding the fishing jar in the line portion.         | 1                | 18 55                     |
| 879 Welding the broken handle of iron safe ..                               | 1                | 7 34                      |
| 880 Reconditioning and welding the track roller of D7. 7052.                | 10               | 85 75                     |
| 881 Reconditioning and welding carrier rollers of D7. 7052.                 | 4                | 42 96                     |
| 882 Reconditioning and welding the sprocket wheel of D7. 7052.              | 2                | 115 73                    |
| 883 Reconditioning the idler wheel of D7. 7052.                             | 2                | 139 81                    |
| 884 Reconditioning the earner blades of D7. 7126                            | 2                | 25 54                     |
| 885 Repairing the bottom wheel harrow ..                                    | 1                | 50 31                     |
| 886 Welding the master pins of D7. 6298 ..                                  | 2                | 12 74                     |
| 887 Grinding the crank shaft journals of TD 9 ..                            | 1                | 32 22                     |
| 888 Reconditioning the TD 14 sprocket wheel ..                              | 2                | 88 18                     |
| 889 Reconditioning the T.6 sprocket wheel ..                                | 2                | 51 57                     |
| 890 Reconditioning the T.6 front idler wheel complete.                      | 1 set.           | 28 16                     |
| 891 Reconditioning the T.6 track roller single flange.                      | 4 Nos.           | 32 78                     |
| 892 Reconditioning the T.6 track roller double flange.                      | 4 Nos.           | 27 92                     |
| 893 Reconditioning the T.6 track carrier roller ..                          | 3 Nos.           | 27 36                     |
| 894 Removing the clutch back plate and reverting with new linings supplied. | 1                | 25 80                     |
| 895 Rivetting the brake lining of P.C.U. D7. 3894.                          | 1                | 8 62                      |
| 896 Reconditioning the broken flange of air cleaner.                        | 1                | 31 13                     |
| 897 Grinding the journals of the W.6 tractor crankshaft.                    | 1                | 17 24                     |
| 898 Brazing the oil line pipe of the D7. 6298 ..                            | 1                | 7 59                      |
| 899 Reconditioning the radiator of D7. 7052 ..                              | 1                | 102 89                    |
| 900 Reconditioning the idler wheel shaft of D7. 7052.                       | 1                | 83 44                     |
| 901 Brazing the air cleaner.                                                | 1                | 12 13                     |
| 902 Reconditioning the welding the clutch housing of D7. 5822.              | 1                | 10 00                     |
| 903 Removing collar and welding idler wheel bracket of D7. 3926.            | 1                | 12 64                     |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                              | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|------------------------------------------------------------------------------------|------------------|---------------------------|
| 904 Reconditioning the shackle bush for lorry MSC 9581.                            | 2                | 28 50                     |
| 905 Repairing and brazing the full line pipe of Vakesa engine.                     | 1                | 13 03                     |
| 906 Soldering the battery lead terminal of lorry MSC 9541.                         | 2                | 32 07                     |
| 907 Rivetting the strips extracting broken studs and welding the diagonal brace.   | 2                | 94 19                     |
| 908 Reconditioning the P.C.U. oil seal and providing dummy plate for D7. 3872.     | 1                | 31 07                     |
| 909 Welding the sidearms of D7. 7052.                                              | 2                | 21 23                     |
| 910 Reconditioning fitting the steering assy bushing of D7. 7052.                  | 1                | 42 85                     |
| 911 Reconditioning the steering pump shaft of D7. 3872.                            | 1                | 11 52                     |
| 912 Reconditioning the TD 14 sprocket wheel of Trichy.                             | 2                | 168 86                    |
| 913 Reconditioning the T6 sprocket wheel of Trichy.                                | 1                | ..                        |
| 914 Reconditioning the dynamo bush of TD 7 engine.                                 | 1                | 6 39                      |
| 915 Welding the lugs and cone to one 18" pipe as per instructions for DD 17 drill. | 1                | 85 51                     |
| 916 Reconditioning the TD 14 corner blades.                                        | 2                | 29 88                     |
| 917 Reconditioning the TD 6 corner blades.                                         | 2                | 15 69                     |
| 918 Reconditioning the band of 9 disc harrow po gh.                                | 1                | 16 48                     |
| 919 Reconditioning the TD 14 centre blade.                                         | 1                | 61 00                     |
| 920 Reconditioning the P.C.U. Drum cover of D7. 2491.                              | 1                | 22 56                     |
| 921 Fitting and setting the bush of steering assy. of D7. 3872.                    | 1 set.           | 5 50                      |
| 922 Reconditioning the D7. D.F. roller.                                            | 3                | 65 13                     |
| 923 Reconditioning the D6 end pins.                                                | 1                | 24 03                     |
| 924 Reconditioning the D6 sprocket wheel.                                          | 1                | 6 85                      |
| 925 Reconditioning and providing washer for pinion shaft (steering of D7. 4180).   | 1                | 30 00                     |
| 926 Reconditioning the spring shackle bush of lorry MSC 9638.                      | 6                | 35 20                     |
| 927 Repairing and providing the key for yale lock at Freeman building.             | 1                | 23 12                     |
| 928 Repairing the H/W. brass knob short sprayer.                                   | 1                | 9 48                      |
| 929 Extending the water hose pipe of J. D. Tractor.                                | 1                | 52 00                     |
| 930 Welding the track roller frame and reconditioning the worn out portion.        | 2                | 24 57                     |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                                | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|----------------------------------------------------------------------|------------------|---------------------------|
| 931 Grinding the journals of D6 crankshaft.                          | 1                | 41 65                     |
| 932 Reconditioning the D7 idler wheel.                               | 1                | 22 79                     |
| 933 Welding the crank case of D4.                                    | 1                | 62 29                     |
| 934 Reconditioning the broken bolts in track roller frame of D4.     | 1                | 35 86                     |
| 935 Welding the draw bar angle of the seed drill.                    | 1                | 8 32                      |
| 936 Welding the side arm support of D4.                              | 1                | 14 82                     |
| 937 Repairing the radiator of D4.                                    | 2                | 46 66                     |
| 938 Reconditioning and welding the bell crank link of D4.            | 4                | 30 88                     |
| 939 Reconditioning the corner blades of D7.                          | 17               | 156 34                    |
| 940 Reconditioning the water tank.                                   | 1                | 22 90                     |
| 941 Rivetting the facing lining to clutch disc.                      | 1                | 4 31                      |
| 942 Rivetting the clutch disc of D7. 5822.                           | 1                | 4 31                      |
| 943 Repairing and welding the gear lever of Bus MDC 9718.            | 1                | 4 31                      |
| 944 Reconditioning and treading the screw of van MSC 3808.           | 5                | 8 32                      |
| 945 Rivetting the brake band lining of D7.4T. 3926.                  | 2                | 31 20                     |
| 946 Reconditioning the 15" dia drill bit.                            | 2                | ..                        |
| 947 Grinding the D6 5R series crankshaft.                            | 1                | 49 34                     |
| 948 Repairs to Hobert welding set.                                   | 1                | 48 37                     |
| 949 Refacing valve of lister blackstone oil engine.                  | 4                | 4 16                      |
| 950 Reconditioning the patrol three way union of lorries.            | 2                | 12 84                     |
| 951 Reconditioning the steering brake band adj. bolt and nut.        | 2                | 3 80                      |
| 952 Reconditioning the doors and handles of Van MSY 3808.            | 1                | 36 68                     |
| 953 Renewing the wire rope and drilling 7/8" hole.                   | 1                | 9 66                      |
| 954 Rivetting brake lining in D7.                                    | 1 set.           | 18 72                     |
| 955 Reconditioning the weeding machines.                             | 6                | 12 60                     |
| 956 Providing handles for copper shim for gaggery rating.            | 1                | 4 89                      |
| 957 Providing handle for copper strainers.                           | 2                | 6 32                      |
| 958 Repairing and providing key for yale lock at free main building. | 2                | 12 64                     |
| 959 Repairing the stud of oven.                                      | 1 No.            | 5 64                      |
| 960 Refacing the foot valve ring of the 68 well.                     | 1                | 2 16                      |
| 961 Providing and stitching cushion covers for MSY 8808.             | 1                | 246 12                    |
| 962 Reconditioning and repairing the wheel burrow of fruit station.  | 1                | 35 35                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                         | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|-------------------------------------------------------------------------------|------------------|---------------------------|
| 963 Reconditioning the yoke bolts of D7. 7052 .                               | 3                | 7 22                      |
| 964 Soldering the file gauge for fuel filter . .                              | 2                | 9 02                      |
| 965 Welding the broken handle of L.B. starting handle.                        | 1                | 1 90                      |
| 966 Repairing the defect of hydraulic pump . .                                | 1                | 20 10                     |
| 967 Repairing the water outlet pipe of water cast.                            | 1                | 4 31                      |
| 968 Bending the teeth of circular saw . . . .                                 | 1                | 8 05                      |
| 969 Repairing the radiator of D7. 4T. 3872 . .                                | 1                | 49 44                     |
| 970 Reconditioning the fan spindle bush . . .                                 | 1                | 15 25                     |
| 971 Removing the broken stud from engine block.                               | 1                | 9 20                      |
| 972 Providing lock washer and stud for fly wheel.                             | 3                | 15 75                     |
| 973 Valve seat cutting and grinding . . . .                                   | 4                | 4 31                      |
| 974 Providing key for crankshaft. . . . .                                     | 1                | 4 31                      |
| 975 Providing extension bolts for drive flange.                               | 3                | 12 78                     |
| 976 Providing bushing and fitting for the governor rod.                       | 2                | 10 69                     |
| 977 Providing Bonjo and lock bolts. . . . .                                   | 3                | 23 26                     |
| 978 Repairing the water pump pins . . . . .                                   | 1                | 19 91                     |
| 979 Welding the air cleaner pipe and container.                               | 1                | 14 00                     |
| 980 Welding and turning the broken journal guide.                             | 1                | 14 98                     |
| 981 Welding the broken angle support seat . . of D.B. cart.                   | 1                | 2 83                      |
| 982 Welding the roller frame of D7. 6298. . .                                 | 1                | 8 90                      |
| 983 Providing strip block for track roller . . frame of D7.                   | 5                | 26 37                     |
| 984 Extracting the bent stuck in steering drum.                               | 1 set.           | 6 83                      |
| 985 Reconditioning the track adj. screw . . .                                 | 1                | 17 00                     |
| 986 Reconditioning the master pin of D7.6298.                                 | 2                | 15 58                     |
| 987 Reconditioning the idler rollers of D7. 6298                              | 2                | 15 78                     |
| 988 Servicing the motor of Wilson lathe and changing the V. belts.            | 1                | 77 40                     |
| 989 Cutting and supply of six half barrels . . to A.A.R. (Soil cons).         | 6                | 203 01                    |
| 990 Welding the broken handle of hand pump.                                   | 1                | 5 31                      |
| 991 Repairing and patch up work for water tank trainer.                       | 1                | 59 02                     |
| 992 Removing broken and providing new . . studs for brake drum of lorry 9616. | 8                | 20 28                     |
| 993 Reconditioning the fuel filter of D7. 5822.                               | 1                | 13 01                     |
| 994 Providing dowels for roller frame bearing.                                | 4                | 16 22                     |
| 995 Reconditioning end bit of D6 corner blade (Bolt).                         | 2                | 38 76                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                               | Quantity.<br>(2) | Amount.<br>(3)<br>RS. NP. |
|---------------------------------------------------------------------|------------------|---------------------------|
| 996 Reconditioning the end bit of D6 corner blade (right).          | 1                | 26 54                     |
| 997 Reconditioning the clutch yoke of D6. . .                       | 1                | 16 16                     |
| 998 Reconditioning the oil cooler of D7. 5R. series.                | 1                | 35 84                     |
| 999 Reconditioning the oil cooler of D6 8 U series.                 | 2                | 59 96                     |
| 1000 Reconditioning the TD 9 brake drum of 8235 D.                  | 1                | 6 24                      |
| 1001 Reconditioning the D6 roller. . . . .                          | 1                | 8 62                      |
| 1002 Reconditioning the D6 S.F. roller . . .                        | 4                | 69 00                     |
| 1003 Cutting labels in G. I sheets as per . . instructions.         | 948              | 24 05                     |
| 1004 Reconditioning and sharpening the victory plough share points. | 10               | 27 59                     |
| 1005 Replacing a bolt in disc attachment of single disc plough.     | 1                | 22 84                     |
| 1006 Removing broken stud from pinion bearing cage.                 | 2                | 15 44                     |
| 1007 Removing bend from wheel rim of JD tractor.                    | 2                | 8 74                      |
| 1008 Reconditioning the washers for the stay rod of JD tractor.     | 2                | 11 41                     |
| 1009 Reconditioning the steering clutch drum rod of D7. 3926.       | 1 set.           | 32 08                     |
| 1010 Reconditioning the clutch cover of D7. 7052.                   | 1                | 16 84                     |
| 1011 Extracting broken stud from clutch shaft of D7. 7126.          | 1                | 8 11                      |
| 1012 Rivetting segments in the clutch disc of D7. 7126.             | 1 set.           | 32 08                     |
| 1013 Soldering the radiator of J.D. Tractor. . .                    | 1                | 7 62                      |
| 1014 Reconditioning the centre master pin of D7. 3872.              | 2                | 6 52                      |
| 1015 Repairing the rubbish cart of Sanitary section.                | 1                | 21 98                     |
| 1016 Reconditioning the water pump hub of D6.                       | 2                | 44 59                     |
| 1017 Cutting and welding pipes as per instructions.                 | 1 set.           | 16 79                     |
| 1018 Reconditioning the clutch fingers of D4. 2T. 4978.             | 4                | 21 75                     |
| 1019 Removing the gear from block of D4. 2T. 4978.                  | 1                | 7 74                      |
| 1020 Refacing the valve of D4. 2T. 4978 . . .                       | 4                | 2 08                      |
| 1021 Reconditioning the sprocket wheel of D4. 2T. 4978.             | 2                | 81 51                     |
| 1022 Reconditioning and welding the chassis of D4. 2R. 4978.        | 1                | 28 90                     |
| 1023 Reconditioning welding the bill crank of D4.                   | 2                | 18 01                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars<br>(1)                                          | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. NP. |
|-------------------------------------------------------------------------------|------------------|---------------------------|
| 1024 Reconditioning and drill hole in clutch shaft of D6.                     | 2                | 4 30                      |
| 1025 Reconditioning and removing broken bolts in D4. brace bearing cup of D4. | 1                | 7 96                      |
| 1026 Reconditioning and welding the idler wheel of D7. 6298.                  | 1                | 51 10                     |
| 1027 Reconditioning the dovel pins of track rollers frame.                    | 4                | 3 44                      |
| 1028 Providing washers for brake drum ..                                      | 4                | 7 97                      |
| 1029 Welding the track in handle of jack hammer.                              | 2                | 10 64                     |
| 1030 Welding the drilling testing jars ..                                     | 2                | 27 23                     |
| 1031 Reconditioning the corner blade of D7. 8078.                             | 2                | 48 37                     |
| 1032 Reconditioning and welding the carrier rollers of D7. 5822.              | 4                | 39 17                     |
| 1033 Reconditioning the flange and repairing the Hobart welding set.          | 1                | 92 66                     |
| 1034 Reconditioning and welding the crank case of D7. 2T. 4978.               | 1                | 57 51                     |
| 1035 Soldering the petrol tank of jeep MSZ 4203.                              | 1                | 19 74                     |
| 1036 Providing and fitting keys for the فرمان hall notice board.              | 2                | 1 00                      |
| 1037 Welding the broken angle bar of O.D.B. cart.                             | 1                | 16 86                     |
| 1038 Repairing the jap interculturators ..                                    | 2                | 12 79                     |
| 1039 Reconditioning the rotor magneto shaft of D4.                            | 2                | 42 45                     |
| 1040 Drilling holes in bed angle plates and welding trolley.                  | 1                | 37 02                     |
| 1041 Welding the water outlet pipe ..                                         | 1                | 19 72                     |
| 1042 Reconditioning the bore in belt to suit shaft.                           | 1                | 54 01                     |
| 1043 Lorry patch up work to MSC 9638 ..                                       | 1                | 36 98                     |
| 1044 Reconditioning and welding carrier roller of D7.                         | 3                | 43 64                     |
| 1045 Welding the flange of J.D. tractor water pump.                           | 1                | 5 23                      |
| 1046 Welding the idler wheel of D7. 4T. 3926 ..                               | 2                | 116 87                    |
| 1047 Reconditioning the glass self of Botany section.                         | 1                | 4 11                      |
| 1048 Reconditioning the pipe sprayer ..                                       | 1                | 9 46                      |
| 1049 Providing the bolts of wheel/of D.B. cart/hub.                           | 1                | 3 80                      |
| 1050 Repairing the junior hole ..                                             | 1                | ..                        |
| 1051 Welding the showl of D4. 2T. 4978 ..                                     | 1                | 142 57                    |
| 1052 Recamber front of rear springs of MSZ 2419.                              | 4                | 14 08                     |
| 1053 Reconditioning the idler lock pin as per sample of D7. 7M. 6298.         | 4                | 8 32                      |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                                     | Quantity.<br>(2) | Amount.<br>(3)<br>Rs. NP. |
|---------------------------------------------------------------------------|------------------|---------------------------|
| 1054 Removing the old sprockets and welding new ones to D4. tractor rims. | 2                | 33 01                     |
| 1055 Turn and supply of one small end bush for RN 5316.                   | 1                | 18 71                     |
| 1056 Reconditioning the centre blade of D4. 2T. 4978.                     | 1                | 49 27                     |
| 1057 Reconditioning the corner blades of D4. 2T. 4978.                    | 2                | 24 58                     |
| 1058 Soldering the fuel tank filter gauge ..                              | 1                | 2 16                      |
| 1059 Reconditioning the water pipe of D7. 4T. 3926.                       | 1                | 5 23                      |
| 1060 Supply of 1" M.S. flange as per instructions.                        | 1                | 20 81                     |
| 1061 Reconditioning the idler wheel of D7. 3874.                          | 2                | 65 37                     |
| 1062 Welding the draw bar and pin of 32 dy. disc harrow plough.           | 1 set.           | 15 58                     |
| 1063 Built up providing threads of steering rod of MSZ 2419.              | 1                | 2 08                      |
| 1064 Repairing the dusting machines ..                                    | 4                | 37 92                     |
| 1065 Repairing the slipsocket slip ..                                     | 2                | 18 96                     |
| 1066 Straightening the J. bolts in the L. shape.                          | 350              | 10 29                     |
| 1067 Reconditioning and welding the TD 14 front idler wheel.              | 1 set.           | 51 26                     |
| 1068 Reconditioning the TD 14 corner blades ..                            | 2                | 23 06                     |
| 1069 Reconditioning the T6. corner blades ..                              | 1                | 5 38                      |
| 1070 Bracing the fuel line pipe ..                                        | 2                | 4 01                      |
| 1071 Refacing the fuel pump body plate assembly                           | 1                | 4 31                      |
| 1072 Reconditioning the track adjustment screw.                           | 1                | 4 38                      |
| 1073 Welding the starting pinion latch ..                                 | ..               | ..                        |
| 1074 Reconditioning the steering clutch drum thread and providing screw.  | 2                | 6 39                      |
| 1075 Reconditioning and welding master pin of D4. tractor.                | 1                | 16 02                     |
| 1076 Repairing the tool box of D4. 2T. 4978 ..                            | 1                | 8 50                      |
| 1077 Welding the guard radiator and connection of D7. 5822.               | 2                | 7 41                      |
| 1078 Welding barrels to stop leakage ..                                   | 12               | 21 41                     |
| 1079 Welding carrier rollers of D7. 5822 ..                               | 2                | 47 09                     |
| 1080 Cutting bamboos into haggling baskets as per instructions.           | 7                | 9 25                      |
| 1081 Reconditioning washers of connecting rod of D6. tractor.             | 8                | 5 81                      |
| 1082 Welding the strips of grouser plates of spares.                      | 14               | 841 99                    |
| 1083 Turning the roller bushing to suit over size shaft D7. 2491.         | 12               | 31 75                     |
| 1084 Rivetting the strips and reconditioning the roller frame D7. 3926.   | 2                | 20 65                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                      | Quantity.<br>(2) | Amount.<br>(3)<br>RS. RP. |
|------------------------------------------------------------|------------------|---------------------------|
| 1149 Reconditioning and welding the pruning latch housing. | 1                | 22 41                     |
| 1150 Reconditioning the silencer exhaust pipe of D7. 7122. | 1                | 15 71                     |
| 1151 Reconditioning the TD. 14 idler roller ..             | 2                | 17 10                     |
| 1152 Welding the clutch hub spline of D7. 7126.            | 1                | 4 31                      |
| 1153 Reconditioning the T6 power take off adopter shaft.   | 1                | 34 19                     |
| 1154 Reconditioning the TD. 14 hydraulic pump shaft.       | 1                | 17 97                     |
| 1155 Reconditioning the hydraulic pump shaft adopter.      | 1                | 26 68                     |
| 1156 Reconditioning the hydraulic pumps shaft coupling.    | 1                | 17 61                     |
| 1157 Welding and reconditioning the jars ..                | 3                | 40 38                     |
| 1158 Coating the grouser plates .. .. .                    | 74               | 546 27                    |
| 1159 Removing bend in the plough shaft ..                  | 1                | 11 32                     |
| 1160 Welding the crack in the chassis .. ..                | 2                | 16 84                     |
| 1161 Enlarging the disc hole to harrow plough ..           | 14               | 61 37                     |
| 1162 Welding the crank shaft V belt pulley ..              | 1                | 11 10                     |
| 1163 Welding the foot valve in cracked place ..            | 1                | 5 33                      |
| 1164 Fitting and setting the screw of ginning machine.     | 1                | 4 31                      |
| 1165 Refacing the valves .. .. .                           | 10               | 2 08                      |
| 1166 Welding and reconditioning the plough pipe.           | 1                | 88 37                     |
| 1167 Welding the D7 showl .. .. .                          | 1                | 54 20                     |
| 1168 Reconditioning the idler wheel collars of D7 3894.    | 4                | 51 35                     |
| 1169 Reconditioning the cushion seat and back rest.        | 1                | 186 40                    |
| 1170 Reconditioning the hub bolt of John Deere tractor.    | 3                | 2 08                      |
| 1171 Rivetting the segments in P.C.U. cone ..              | 1                | 14 94                     |
| 1172 Providing hood to W6 tractor .. ..                    | 1                | ..                        |
| 1173 Soldering the mouth of tins .. .. .                   | 12               | 14 30                     |
| 1174 Repairing the ½ Gln. sprayer .. .. .                  | 1                | 11 41                     |
| 1175 Sharpening the saw teeth .. .. .                      | 1                | 6 32                      |
| 1176 Sharpening the crow bar end .. .. .                   | 1                | 6 18                      |
| 1177 Repairing the sprayer .. .. .                         | 1                | 68 50                     |
| 1178 Repairing the wheel harrow .. .. .                    | 1                | 11 91                     |
| 1179 Repairing the lawn mover .. .. .                      | 1                | 21 14                     |
| 1180 Welding the victory plough wheel .. ..                | 1                | 16 11                     |
| 1181 Repairing the digging fork .. .. .                    | 1                | 2 06                      |
| 1182 Reconditioning and set right the axle of water cart.  | 1                | 73 10                     |
| 1183 Reconditioning the centre blade of D7 4180            | 1                | 69 34                     |

## APPENDIX No. 21—cont.

*List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.*

| Serial number and particulars.<br>(1)                         | Quantity.<br>(2) | Amount.<br>(3)<br>RS. RP. |
|---------------------------------------------------------------|------------------|---------------------------|
| 1184 Reconditioning the corner blades of D7 4180              | 2                | 39 98                     |
| 1185 Grinding the crank shaft .. .. .                         | 1                | 52 95                     |
| 1186 Reconditioning and welding the push beam of D6.          | 2                | ..                        |
| 1187 Reconditioning the front idler wheel of D6..             | 1                | 22 01                     |
| 1188 Reconditioning the sprocket wheel of D6 ..               | 2                | 60 28                     |
| 1189 Reconditioning the centre blades of D6 ..                | 1                | 73 69                     |
| 1190 Reconditioning the clutch lever shaft and bush of D6.    | 1                | 18 97                     |
| 1191 Clutch housing providing bush and shaft ..               | 1                | 31 53                     |
| 1192 Reconditioning the corner blades .. ..                   | 15               | 98 10                     |
| 1193 Providing bolts for brake drum .. .. .                   | 4                | 15 35                     |
| 1194 Providing sleeves to cylinder head of D6 ..              | 2                | 68 04                     |
| 1195 Reconditioning and rebuilding the fire brick             | 1                | 166 05                    |
| 1196 Turn and supply P.B. Bush to Water pump.                 | 1                | 39 68                     |
| 1197 Reconditioning the radiator of D7 .. ..                  | 1                | 176 25                    |
| 1198 Hydraulic pump shaft to renew old collder                | 2                | 32 50                     |
| 1199 Welding the light switch .. .. .                         | 1                | 2 45                      |
| 1200 Reconditioning the studs for left wheel drum of lorry.   | 8                | 25 44                     |
| 1201 Sharpening and providing handles .. ..                   | 1                | 19 81                     |
| 1202 Sharpening the mammutties .. .. .                        | 1                | 4 42                      |
| 1203 Reconditioning and providing handle for fork.            | 1                | 8 39                      |
| 1204 Sharpening the teeth of saw .. .. .                      | 5                | 15 34                     |
| 1205 Sharpening the pruning shares .. .. .                    | 3                | 12 20                     |
| 1206 Rakes providing handles .. .. .                          | 1                | 14 98                     |
| 1207 Providing handles to hand hoes .. .. .                   | 1                | 4 30                      |
| 1208 Providing handle and sharpening bill-hook..              | 5                | 12 93                     |
| 1209 Providing handle and sharpening pick-axe                 | 1                | 7 44                      |
| 1210 Reconditioning and welding track rollers ..              | 6                | 84 96                     |
| 1211 Reconditioning the motor pulley of well No. 60.          | 1                | 10 10                     |
| 1212 Welding the M. S. Tank in the A grade Bungalow.          | 1                | 64 51                     |
| 1213 Repairing the Radiator of the compressor..               | 1                | 20 74                     |
| 1214 Reconditioning the steel plates of D7 ..                 | 36               | 48 16                     |
| 1215 Repairing the chassis of the fodder station..            | 2                | 60 46                     |
| 1216 Reconditioning the bolt of the miko stand ..             | 2                | 40 53                     |
| 1217 Reconditioning the wheel drum bolts of the tank trailer. | 2                | 29 70                     |
| 1218 Built up and coating the track links ..                  | 1                | 295 06                    |
| 1219 Welding the head of the grouser bolts ..                 | 115              | 47 06                     |
| 1220 Reconditioning the radiator tank cover ..                | 1                | 18 54                     |
| 1221 Repairing the night soil cart .. .. .                    | 1                | 7 34                      |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                             | Quantity.<br>(2) | Amount.<br>(3) |
|-------------------------------------------------------------------|------------------|----------------|
|                                                                   |                  | RS. NP.        |
| 1222 Repairing the steering of the formal tractor.                | 1                | 30 39          |
| 1223 Reconditioning the trailer wheel rim ..                      | 1                | 17 92          |
| 1224 Welding the flange to the water tank ..                      | 1                | 10 56          |
| 1225 Providing key grooves to the counter-shaft                   | 2                | 72 71          |
| 1226 Reconditioning and repairing the hoisting jar.               | 1                | 18 14          |
| 1227 Fitting and repairing the welding cable ..                   | 1                | 883 06         |
| 1228 Reconditioning the corner blades of D7 ..                    | 2                | 52 56          |
| 1229 Reconditioning the brake stand ..                            | 1                | 5 50           |
| 1230 Reconditioning the track rollers of D7 ..                    | 5                | 121 09         |
| 1231 Reconditioning the track master pin ..                       | 1                | 14 28          |
| 1232 Soldering the fuel tube ..                                   | 1                | 1 96           |
| 1233 Providing the copper pump for the use of glue pot.           | 1                | 10 84          |
| 1234 Reconditioning the studs for right wheel drum.               | 8                | 20 76          |
| 1235 Repairing the distilled water still ..                       | 1                | 19 98          |
| 1236 Repairing and fitting the chimney of artificial rain making. | 1                | 48 26          |
| 1237 Soldering the steam over.                                    | 1                | 6 60           |
| 1238 Reconditioning the filter connection tube ..                 | 2                | 32 08          |
| 1239 Repairing the caseuleum of the fodder office                 | 1                | 5 22           |
| 1240 Reconditioning the centre blade of D7 ..                     | 1                | 87 12          |
| 1241 Reconditioning the corner blade of D7 ..                     | 2                | 42 00          |
| 1242 Drill holes in the rubber stopper ..                         | 11               | 3 92           |
| 1243 Welding the frame of the 24 disc harrow ..                   | 2                | 51 54          |
| 1244 Reconditioning the silencer of D7 ..                         | 2                | 28 04          |
| 1245 Reconditioning the brake adj. screw of D7.                   | 1                | 4 68           |
| 1246 Supply of 40 Gln. drum ..                                    | 1                | 52 28          |
| 1247 Welding the roller frame of D7 ..                            | 2                | 16 16          |
| 1248 Welding the clutch shaft of M.H. ..                          | 1                | 17 02          |
| 1249 Providing strips to the grouser plates ..                    | 74               | 1,158 50       |
| 1250 Extracting the broken bolt ..                                | 2                | 3 92           |
| 1251 Repairing the wooden chairs..                                | 3                | 76 26          |
| 1252 Reconditioning the carrier roller shaft of D7.               | 1                | 12 21          |
| 1253 Repairing the canopy of the formal A tractor.                | 1                | 20 80          |
| 1254 Providing a foldable cover canvas..                          | 1                | ..             |
| 1255 Building up model and reconditioning the track rollers.      | 5                | 180 06         |
| 1256 Reconditioning the hydraulic press piston.                   | 1                | 34 86          |
| 1257 Reconditioning the carrier roller shaft of D7.               | 4                | 58 95          |
| 1258 Repairing the supporting rod of shaking machine              | 1                | 2 65           |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                  | Quantity.<br>(2) | Amount.<br>(3) |
|--------------------------------------------------------|------------------|----------------|
|                                                        |                  | RS. NP.        |
| 1259 Soldering the broken water copper still ..        | 1                | 9 02           |
| 1260 Welding the broken parts of chassis ..            | 1                | 106 11         |
| 1261 Soldering the air cleaner fan ..                  | 1                | 6 70           |
| 1262 Reconditioning the master pin collars ..          | 2                | 1 04           |
| 1263 Rivetting the P.C. Cone ..                        | 1                | 13 84          |
| 1264 Reconditioning the harrow shaft ..                | 3                | 42 02          |
| 1265 Reconditioning the starting mechanism push lever. | 1                | 7 63           |
| 1266 Welding the back seat of the jeep ..              | 1                | 4 09           |
| 1267 Repairing the radiator ..                         | 1                | 30 04          |
| 1268 Reconditioning the starting switch ..             | 1                | 7 84           |
| 1269 Reconditioning the recoil spring ..               | 1                | 18 07          |
| 1270 Reconditioning the starting handle ..             | 1                | 28 54          |
| 1271 Reconditioning and welding the silencer of D7.    | 1                | 6 40           |
| 1272 Reconditioning the starting handle ..             | 1                | 8 22           |
| 1273 Cutting the chain links ..                        | 1                | 15 92          |
| 1274 Repairing the night soil cart ..                  | 1                | ..             |
| 1275 Repairing the distilled water shells ..           | 2                | 15 04          |
| 1276 Reconditioning the corner blades of D7 ..         | 2                | 70 38          |
| 1277 Reconditioning the starting engine pinion.        | 1                | 15 74          |
| 1278 Reconditioning the starting handle ..             | 1                | 6 19           |
| 1279 Repairing the pruning shares ..                   | 2                | 17 50          |
| 1280 Repairing the lawn mover ..                       | 1                | 7 84           |
| 1281 Repairing the duster ..                           | 1                | 6 80           |
| 1282 Repairing the wheel harrow ..                     | 1                | 22 98          |
| 1283 Reconditioning the valve guide of the bus.        | 1                | 2 08           |
| 1284 Drilling the extracting the broken studs ..       | 1                | 5 80           |
| 1285 Welding the basin clamp ..                        | 1                | 11 63          |
| 1286 Repairing the table model gin ..                  | 1                | 18 02          |
| 1287 Repairing the bonnet cover of D7 ..               | 1                | 53 68          |
| 1288 Providing key to a sit pulley ..                  | 2                | 12 24          |
| 1289 Grinding the crank shaft ..                       | 1                | 48 71          |
| 1290 Repairing the mammutties ..                       | 2                | 17 87          |
| 1291 Repairing the pruning shares ..                   | 3                | 8 88           |
| 1292 Reconditioning the harrow pipe ..                 | 1                | 25 26          |
| 1293 Rethreading the oil engine sleeve ..              | 1                | 7 09           |
| 1294 Automizer nozzle dowel hole drilling ..           | 1                | 2 06           |
| 1295 Reconditioning the pump shaft ..                  | 1                | 36 02          |
| 1296 Reconditioning the carrier rollers of D7 ..       | 1                | 8 95           |
| 1297 Repairing the blower of DD6 ..                    | 1                | 26 37          |
| 1298 Welding the pipes ..                              | 2                | 18 94          |



## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.                           | Quantity. | Amount. |
|----------------------------------------------------------|-----------|---------|
| (1)                                                      | (2)       | (3)     |
|                                                          |           | RS. NP. |
| 1299 Reconditioning the sprocket wheel ..                | 1         | 85 14   |
| 1300 Reconditioning the bottom of the ropo filter point. | 1         | 1 04    |
| 1301 Soldering the bellow seal of D7 ..                  | 1         | 1 45    |
| 1302 Reconditioning the track rollers of D7 ..           | 5         | 46 60   |
| 1303 Reconditioning the air cleaner of D7. ..            | 1         | 7 46    |
| 1304 Reconditioning the drilling jars ..                 | 2         | 35 94   |
| 1305 Drilling holes and making dewels ..                 | 2         | 5 50    |
| 1306 Reconditioning the cutter stem of D6 ..             | 1         | 4 84    |
| 1307 Cleaning the threads ..                             | 1         | 3 99    |
| 1308 Repairing the triangle harrows ..                   | 1         | 12 46   |
| 1309 Reconditioning the track adjusting screw..          | 1         | 49 19   |
| 1310 Welding the mudguard of the lorry..                 | 1         | 6 52    |
| 1311 Repairing the rose cane ..                          | 1         | ..      |
| 1312 Repairing the cart ..                               | 1         | 14 15   |
| 1313 Repairing the foot pump ..                          | 1         | 3 92    |
| 1314 Cutting and threading the pipe ..                   | 2         | 5 23    |
| 1315 Reconditioning the outer rim of D4..                | 2         | 64 18   |
| 1316 Reconditioning the push beam ..                     | 3         | 69 14   |
| 1317 Reconditioning the trunnion bearing ..              | 2         | 19 73   |
| 1318 Reconditioning the over holde of D4 ..              | 2         | ..      |
| 1319 Reconditioning the worn out pin ..                  | 2         | 8 64    |
| 1320 Reconditioning the collar face ..                   | 2         | 59 21   |
| 1321 Fixing new balls and threads ..                     | 4         | 53 66   |
| 1322 Reconditioning the edge of D4 ..                    | 12        | 54 97   |
| 1323 To tune the hole and fixing a bush..                | 1         | 13 04   |
| 1324 To weld nut and put a screw ..                      | 1         | 5 16    |
| 1325 Welding the crack portion ..                        | 1         | 14 92   |
| 1326 Reconditioning the guntake blades..                 | 6         | 49 85   |
| 1327 Set right the handle of the victory plough..        | 3         | ..      |
| 1328 Prociding adopter and welding ..                    | 1         | 38 45   |
| 1329 Reconditioning and repairing the ladder ..          | 1         | ..      |
| 1330 Repairing the balance machine ..                    | 1         | ..      |
| 1331 Reconditioning the cushion seats of D4 ..           | 2         | ..      |
| 1332 Soldering the radiator of D7 ..                     | 1         | ..      |
| 1333 Repairing the seat sitting of D7 ..                 | 1         | ..      |
| 1334 Repairing the cycle pump ..                         | 1         | ..      |
| 1335 Repairing the sprayer..                             | 1         | ..      |
| 1336 Reconditioning the brake adjusting screw of D7.     | 1         | 8 63    |
| 1337 Welding the bearing ..                              | 1         | 11 26   |
| 1338 Reconditioning the radiator wind screen ..          | 2         | 8 82    |
| 1339 Gudge or pin bushes ..                              | 2         | 5 12    |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.                              | Quantity. | Amount. |
|-------------------------------------------------------------|-----------|---------|
| (1)                                                         | (2)       | (3)     |
|                                                             |           | RS. NP. |
| 1340 Reconditioning the left side corner blade ..           | 1         | 34 37   |
| 1341 Clutch centre locking screw grooves ..                 | 1         | 98 50   |
| 1342 Centre bore to be rebored ..                           | 1         | 2 62    |
| 1343 Centre keys to be renewed ..                           | 1         | 11 76   |
| 1344 Reconditioning the clutch adjusting bush..             | 1         | 9 44    |
| 1345 Reconditioning the Joggle lever ..                     | 1         | 18 31   |
| 1346 Welding the fork ..                                    | 1         | 9 44    |
| 1347 Reconditioning the clutch shifts ..                    | 4         | ..      |
| 1348 Providing clutch collars ..                            | 6         | 100 93  |
| 1349 Reconditioning the shaft ..                            | 1         | 65 37   |
| 1350 Reconditioning the shield of John Deere ..             | 1         | 14 34   |
| 1351 Removing track adjusting screw ..                      | 1         | 81 63   |
| 1352 Welding carrier roller of D7 ..                        | 2         | 19 03   |
| 1353 Turning and fixing the bearing ..                      | 2         | 2 62    |
| 1354 Reconditioning welding the sprocket wheel..            | 2         | 70 26   |
| 1355 Reconditioning the sheet plates to remove bend.        | 46        | 76 28   |
| 1356 Reconditioning the idler wheel collers of D7           | 4         | ..      |
| 1357 Reconditioning the remove bend in the P.C.U. guard.    | 2         | 14 39   |
| 1358 Welding the broken parts of the sickless ..            | 7         | 1 57    |
| 1359 Welding and sharpening the cutting knife ..            | 1         | 1 29    |
| 1360 Fixing handle of Kurchika ..                           | 3         | 4 96    |
| 1361 Welding and fixing hook ..                             | 1         | 3 23    |
| 1362 Fixing and reconditioning the handle to wooden roller. | 1         | ..      |
| 1363 Replacing of centre bolt ..                            | 1         | 19 31   |
| 1364 Repairing the mammuties ..                             | 2         | 7 70    |
| 1365 Repairing the hand hoos ..                             | 6         | 14 16   |
| 1366 Check and rectify the left door of van ..              | 1         | 3 92    |
| 1367 Fitting a new bracket for the horn of van ..           | 1         | 6 36    |
| 1368 Reconditioning the track adjusting spanner.            | 1         | 6 10    |
| 1369 Reconditioning back seat providing pubble cushion.     | 2         | ..      |
| 1370 Reconditioning the radiator of D7 ..                   | 1         | ..      |
| 1371 Reconditioning and removing bend ..                    | 1         | 1 96    |
| 1372 Removing the bend in dozer pin ..                      | 1         | 1 96    |
| 1373 Reconditioning the Idler wheels of D6 ..               | 2         | 60 18   |
| 1374 Reconditioning and welding the 'A' frame of D7.        | 1         | 10 49   |
| 1375 Repairing the filter point ..                          | 1         | 27 20   |
| 1376 Welding the chasis crables ..                          | 1         | ..      |
| 1377 Providing brackets for light and battery..             | 2         | 10 91   |
| 1378 Repairing the cabinets of Microscope ..                | 2         | 13 77   |
| 1379 Rewelding the bonnet and bend to be removed.           | 1         | 24 16   |
| 1380 Reconditioning the sprocket wheel of D6 ..             | 3         | 207 12  |
| 1381 Reconditioning the D.F. roller with shaft of D6.       | 3         | 50 06   |

## APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1959 to 30th June 1960—cont.

| Serial number and particulars.<br>(1)                    | Quantity.<br>(2) | Amount.<br>(3)    |
|----------------------------------------------------------|------------------|-------------------|
| 1382 Reconditioning the D.F. roller without shaft of D6. | 5                | rs. NP.<br>105 62 |
| 1383 Reconditioning S.F. roller with shafts ..           | 1                | 10 72             |
| 1384 Reconditioning the S.F. roller without shaft.       | 2                | 43 38             |
| 1385 Reconditioning the track carrier roller of D6.      | 1                | 6 00              |
| 1386 Reconditioning TD 14 Track carrier roller ..        | 1                | 10 26             |
| 1387 Reconditioning the belly plate of D6 ..             | 1                | 13 60             |
| 1388 Grinding the crank shaft of D6 ..                   | 1                | 39 02             |
| 1389 Reconditioning the crown wheel shaft of D6.         | 1                | 123 01            |
| 1390 Reconditioning the gate valve of orchard well.      | 1                | 3 92              |
| 1391 Repairing the lifting dogs .. ..                    | 10               | 20 98             |
| 1392 Welding the cylinder head of the lorry ..           | 1                | 49 82             |
| 1393 Providing gland packing collar .. ..                | 1                | 42 39             |
| 1394 Providing outer collar for pump .. ..               | 2                | 14 38             |
| 1395 Welding the cracked portion of the jar ..           | 1                | 11 48             |
| 1396 Reconditioning the self starter bush ..             | 1                | 12 36             |
| 1397 Welding the corner blade .. ..                      | 1                | 15 02             |
| 1398 Welding the trunion bearings .. ..                  | 1                | 19 14             |
| 1399 Repairing the front dozer .. ..                     | 4                | ..                |
| 1400 Repairing the R.R.R. duplicator .. ..               | 1                | 4 42              |
| 1401 Repairing the drilling jars .. ..                   | 2                | 61 10             |
| 1402 Cutting the centre blade of D7 .. ..                | 1                | 4 90              |
| 1403 Repairing the S.F. pulley .. ..                     | 1                | 6 04              |
| 1404 Removing the diagonal bearing .. ..                 | 4                | 21 40             |
| 1405 Reconditioning the clutch lever bush ..             | 1                | 10 76             |
| 1406 Providing and supply of M.S. bolt .. ..             | 1                | 8 71              |
| 1407 Reconditioning the carrier roller of D7 ..          | 3                | 39 91             |
| 1408 Reconditioning the street plates of D7 ..           | 23               | 40 59             |
| 1409 Reconditioning the master pin of D7 ..              | 1                | 4 86              |
| 1410 Reconditioning the self starter bushes ..           | 2                | 10 56             |
| 1411 Reconditioning the master pin of D7 ..              | 2                | 8 31              |
| 1412 Reconditioning the clutch lever link ..             | 1                | 2 39              |
| 1413 Welding the leaky barrels .. ..                     | 3                | 7 51              |
| 1414 Repairing the spring balance .. ..                  | 1                | 8 22              |
| 1415 Reconditioning the water jacket pipe of D7.         | 1                | 14 40             |
| 1416 Cut and reconditioning the bolts .. ..              | 12               | 14 38             |
| 1417 Reconditioning the brake and clutch ..              | 3                | ..                |
| 1418 Welding the bolt with slip .. ..                    | 1                | 14 33             |
| 1419 Reconditioning the track link Collers of D7.        | 4                | 4 62              |
| 1420 Reconditioning the brake line pipe .. ..            | 1                | 3 92              |
| 1421 Reconditioning the sleeve block .. ..               | 1                | 10 82             |
| 1422 Welding up the cutting edge of the under steamer.   | 1                | 37 37             |
| Total ..                                                 | 4,619            | 52,473 63         |

## APPENDIX No. 22.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year ending 1st July 1959 to 30th June 1960—cont.

| Serial number and jeep number.<br>(1) | Nature of repairs done.<br>(2)                                                                                                                                                                                                     |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 MSC 9581 ..                         | (1) Cylinder block rebored to 030 O. S. and received pistons fitted.<br>(2) Main and car rods bearings changed.<br>(3) Repairs to springs, steering body were carried out.                                                         |
| 2 MSC 9638 ..                         | (1) Engine turned up.<br>(2) Electrical System checked.<br>(3) Body patching work carried out.                                                                                                                                     |
| 3 MSC 9551 ..                         | Main repairs just as dynamo overhauling, Changing of pin were attended.                                                                                                                                                            |
| 4 MSC 9616 ..                         | (1) Repairing the Clutch and brake were attended.<br>(2) Timing case oil seal changed.                                                                                                                                             |
| 5 MSC 9612 ..                         | (1) Renewing broken axle studs and fixing up new studs.<br>(2) Tuning up engine.                                                                                                                                                   |
| 6 MSC 9585 ..                         | (1) Tuning engine.<br>(2) Brake system checked.                                                                                                                                                                                    |
| 7 MSC 2419 ..                         | Repairs to brake system was attended                                                                                                                                                                                               |
| 8 Vanguard 3808. MSY                  | (1) Brakes adjusted.<br>(2) Steering linkages checked.<br>(3) Engine tuned up.<br>(4) Self starter overhauled.<br>(5) Silencer reconditioned.                                                                                      |
| 9 Studebaker MDC 8618.                | (1) Bluding and adjusting of brakes.<br>(2) Clutch overhauled.                                                                                                                                                                     |
| 10 MSZ 2419 ..                        | (1) The brakes were retined.<br>(2) Shade cups were renewed.<br>(3) Brakes were adjusted.                                                                                                                                          |
| 11 MSC 9616 ..                        | Timing cases oil seal renewed.                                                                                                                                                                                                     |
| 12 MDC 9718 ..                        | (1) Overhauled the brake system.<br>(2) Rear and front springs spares and bushes renewed.<br>(3) King pin and bushes renewed.<br>(4) Steering gear box overhauled.<br>(5) Body completely repainted.<br>(6) Body patch works done. |
| 13 MDC 9612 ..                        | (1) Major overhauled.<br>(2) Serviced the brakes.<br>(3) Patch work for body done.<br>(4) Electrical System was completely checked.<br>(5) Wiring renewed wherever necessary.<br>(6) Body completely repainted.                    |
| 14 MSC ..                             | Dynamo was completely dismounted, checked cleaned and worn out parts renewed.                                                                                                                                                      |
| 15 MSC 9638 ..                        | Rear Wheel bearings were renewed.                                                                                                                                                                                                  |
| 16 MSC 9581 ..                        | (1) Water pump repaired.<br>(2) Right side front spring centre bolt renewed.<br>(3) Engine tune up.<br>(4) Brakes adjusted.                                                                                                        |
| 17 MSC 2419 ..                        | (1) Wiper assembly renewed.<br>(2) Turned up electrical horns fitted.<br>(3) Soldered leak in radiator.<br>(4) Body and rear door repaired.                                                                                        |

## APPENDIX No. 22—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year ending 1st July 1959 to 30th June 1960—cont.

| Serial number and Lorry number. | Nature of repairs done.                                                                                                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                             | (2)                                                                                                                                      |
| <i>Lorries—cont.</i>            |                                                                                                                                          |
| 18 MSC 9816 ..                  | (1) High tension coil renewed.<br>(2) Dynamo and oil out checked and reset.<br>(3) Engine turned up.<br>(4) Minor repairs done.          |
| 19 MSC 9594 ..                  | Services of two casual mazdoors sent.                                                                                                    |
| 20 MSC 9638 ..                  | (1) All four wheels checked.<br>(2) Brakes adjusted.<br>(3) Axle casing turned to suit new oil seats.                                    |
| 21 MSC 9551 ..                  | (1) Renewed bend in bumper.<br>(2) Renewed bend in trad rod.<br>(3) Turned up engine.                                                    |
| 22 MSC 9581 ..                  | Studs in rear wheel—Minor repairs done.                                                                                                  |
| 23 MSC 9616 ..                  | Water pump repaired and frayed wires insulated.                                                                                          |
| 24 MSC 9551 ..                  | Minor Repairs done—Body painting done.                                                                                                   |
| 25 MSC 9638 ..                  | Engine tune up—Brake overhauled.                                                                                                         |
| 26 MSC 9554 ..                  | Services lent.                                                                                                                           |
| 27 MSC 9581 ..                  | Front spring leaf repaired.                                                                                                              |
| 28 MSC 9638 ..                  | Body painting done.                                                                                                                      |
| 29 MSC 9612 ..                  | Front wheel cylinder checked. The rod ends checked and renewed. Speedometer checked and parts renewed.                                   |
| 30 MSC 9581 ..                  | Brakes adjusted—Petrol line repaired.                                                                                                    |
| 31 MSC 9616 ..                  | Brake drum repaired.                                                                                                                     |
| 32 MSC 9638 ..                  | Self starter overhauled—Engine tune up.                                                                                                  |
| 33 MSC 9551 ..                  | Clutch and brakes adjusted engine tune up—General check up done.                                                                         |
| 34 MSC 9551 ..                  | Broken studs renewed and raw studs fitted up.                                                                                            |
| 35 MSC 9616 ..                  | Sprag plug cleaned and brake pedal adjusted                                                                                              |
| 36 MSC 9583 ..                  | Drumshed for stepny wheel replaced and front bolt renewed.                                                                               |
| 37 MSC 9638 ..                  | Main leaf for front light side renewed and centre bolt renewed.                                                                          |
| 38 MSC 9581 ..                  | Engine tune up. Brakes adjusted, oil seal for rear wheel renewed—A. C. pump checked.                                                     |
| 39 MSC 9551 ..                  | Self starter and master cylinder of lorry checked.                                                                                       |
| <i>Jeep.</i>                    |                                                                                                                                          |
| 1 MSZ 4808 ..                   | (1) Reconditioning silencer bracket.<br>(2) Engine tuned.                                                                                |
| 2 MSC 4203 ..                   | (1) Front body patching up.<br>(2) Painting the body.<br>(3) Renewing the electrical system.<br>(4) Engine turned up.                    |
| 3 MSC 5048 ..                   | Changed propeller shaft yoke.                                                                                                            |
| 4 MDE 1231 ..                   | (1) Repaired the radiator.<br>(2) Adjusted the cut oil.                                                                                  |
| 5 MSP 1809 ..                   | (1) Checked and recond the electrical system.<br>(2) Turned up the engine.<br>(3) Renewed the petrol unions.<br>(4) Adjusted the brakes. |

## APPENDIX No. 22—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year ending 1st July 1959 to 30th June 1960—cont.

| Serial number and Lorry number. | Nature of repairs done.                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                             | (2)                                                                                                                                                     |
| <i>Jeep—cont.</i>               |                                                                                                                                                         |
| 6 MSY 4808 ..                   | (1) 500 miles service offered.<br>(2) decarbonised.                                                                                                     |
| 7 MSZ 5048 ..                   | (1) Repaired the petrol tank.<br>(2) Replaced the gear knob.<br>(3) Welded the rear minor rod.<br>(4) Provided a bracket for the silencer.              |
| 8 MDE 729 ..                    | Adjusted the hydraulic brake.                                                                                                                           |
| 9 MDC 7879 ..                   | Dismantled the entire jeep part by paid to prepare estimation for major overhauling the jeep.                                                           |
| 10 MSY 3803 ..                  | Checked and rectified defects in wheel bobbling and overhauled the suspension.                                                                          |
| 11 MSP 1809 ..                  | (1) Repaired the silencers and exhausted pipe.<br>(2) Grinded the valves.                                                                               |
| 12 MSY 3808 Van.                | (1) Renewed the steering track rods and nuts.<br>(2) Checked up wheel alignment.<br>(3) Renewed the flexible hose and bend the hydraulic clutch system. |
| 13 MSZ 3808 Van.                | Tuned up engine.                                                                                                                                        |
| 14 MSY 3808 Van-guard van.      | Tuned up the engine.                                                                                                                                    |
| 15 MSZ 5048 ..                  | Renewed oil retainers and release bearing—radiator soldered—Ignition switch fitted up—universal joints checked.                                         |
| 16 MDC 9718 Bus ..              | Starting trouble rectified.                                                                                                                             |
| 17 MSZ 3808 Van.                | General tune up and wheel alignment attended.                                                                                                           |
| 18 Jeep MDC 3362.               | Speedometer inner and outer cables renewed oil seal.                                                                                                    |
| 19 MDZ 4203 ..                  | Leakage in petrol tank stopped—Brakes adjusted steering overhauled—Engine tuned up—Radiator repaired.                                                   |
| 20 MDC 9718 Bus.                | Leakage water pump checked up—Engine checked and repairs due.                                                                                           |
| 21 MSZ 3808 Van ..              | Engine tuned up brakes adjusted—All oils repewed.                                                                                                       |
| 22 MSZ 4203 Jeep ..             | Self starter overhauled.                                                                                                                                |
| 23 MDO 1803 Van.                | Vehicle checked for repairs.                                                                                                                            |
| 24 MSZ 3808 ..                  | The following were overhauled—Gear box differential clutch and left back door.                                                                          |
| 25 MSZ 9594 Jeep ..             | Water pump kit replaced.                                                                                                                                |
| 26 MSZ 5048 Jeep ..             | Oil seal for front left wheel renewed.                                                                                                                  |
| 27 MSZ 4808 Jeep ..             | Piston rings renewed steering checked up and defects rectified.                                                                                         |
| 28 MSZ 4203 Jeep ..             | Dynamo checked and necessary repairs done.                                                                                                              |
| 29 MSZ 3808 Van ..              | Radiator repaired—Engine tune up.                                                                                                                       |
| 30 MSZ 4203 Jeep ..             | Water pump repaired—Petrol tank soldered—shackle pins renewed.                                                                                          |
| 31 MSZ 4808 Jeep ..             | Brakes adjusted.                                                                                                                                        |
| 32 MDC 9594 ..                  | Engine tuned up and brakes adjusted.                                                                                                                    |
| 33 MDC 1231 ..                  | Engine Decarbonise—Stay and tie rods checked—Horn switch changed—packing cork of gear box changed, Minor repairs done.                                  |

## APPENDIX No. 22—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year ending 1st July 1959 to 30th June 1960—cont.

| Serial Number and jeep number.                                            | Nature of repairs done.                                                                                                                         |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                                                                       | (2)                                                                                                                                             |
| <i>Jeep—cont.</i>                                                         |                                                                                                                                                 |
| 34 MDY Van 3808.                                                          | Gear box overhauled—Silencers repaired and tail pipe renewed—Engine tuned up.                                                                   |
| 35 MDN 3095 Van.                                                          | Piston rings renewed—Valves—Ground in and minor repairs attended.                                                                               |
| 36 Van MDO 1103.                                                          | The following works are under progress :—<br>(1) Renewal of piston rings.<br>(2) Renewal of valves.<br>(3) Overhauling of brake system.         |
| 37 MDC 9718 Bus ..                                                        | Examination and major overhauling of engine and transmission were attended.                                                                     |
| 38 MDC 8350 Jeep.                                                         | The repairs are under progress.                                                                                                                 |
| 39 MDC 9594 Jeep.                                                         | Repairs to self starter done.                                                                                                                   |
| 40 MDC 1231 Jeep.                                                         | Tuning the engine and adjusting the valve—Repairing and welding the back seat—Replacing stepney in the back—Charging the battery—Minor repairs. |
| 41 MDE 729 ..                                                             | Repairing adjusting the clutch pedal.                                                                                                           |
| 42 Van MDO 4072.                                                          | Engine tuned up—Self starter defects rectified, new horn fitted up and new sealed beam fitted up.                                               |
| <i>Tractors.</i>                                                          |                                                                                                                                                 |
| 1 20K. M. H. MDU 1893.                                                    | (1) Overhauling of this tractor was done.<br>(2) Repairs to radiator, clutch engine, steering were attended.                                    |
| 2 D4. 6U 3484 Bulldozer.                                                  | (1) Engine overhauled.<br>(2) Repairs to steering Clutch final disc mechanism were attended.                                                    |
| 3 Formal Tractor of the Director, Sugarcane Breeding Station, Coimbatore. | (1) Decarbonised this unit.<br>(2) Over size rings changed.<br>(3) The unit was completely checked up and put on road.                          |
| 4 D4. 6U. 3482 ..                                                         | Major overhauling is being continued.                                                                                                           |
| 5 MDC. 4517-20 M. H.                                                      | (1) Repairs to dynamo.<br>(2) Changing fan belt.<br>(3) Changing rear wheel key completed in 1/60, etc.                                         |
| 6 W6 NDC 6775 ..                                                          | Major overhauling is in finishing stage.                                                                                                        |
| 7 D4. 2T 4978 ..                                                          | The cylinder head reconditioned and the valve grounded in.                                                                                      |
| 8 D7. 7H. 7052 ..                                                         | The engine valves were refaced.                                                                                                                 |
| 9 John Deere Tractor MDC 5879.                                            | Starting trouble rectified—Providing bush to clutch leavers.                                                                                    |
| 10 W. 6. Tractor MDC 6775.                                                | The lights were repaired and fitted.                                                                                                            |
| 11 Formal 'A' Tractor MDC 9218.                                           | Repairs to steering and minor repairs effected.                                                                                                 |
| 12 D 6 Cylinder heads.                                                    | Grinding valves—Renewal of valves guides—Renew valves seat were attended to.                                                                    |
| 13 D4 Starting engine.                                                    | Tee engine blocks were reconditioned.                                                                                                           |
| 14 D4 Cylinder head.                                                      | The D4 cylinder heads were reconditioned.                                                                                                       |

## APPENDIX No 22—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year ending 1st July 1959 to 30th June 1960—cont.

| Serial number.                                                                             | Nature of repairs done.                                                                 |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| (1)                                                                                        | (2)                                                                                     |
| <i>Other Machineries.</i>                                                                  |                                                                                         |
| 1 Pump set in well No. 77.                                                                 | Dismantled by pump set and bearing were changed the pumpset was assembled.              |
| 2 Turbine pump of bore well No. 42.                                                        | Pumpset received from the bore well refilled after changing the broken grinder.         |
| 3 Pumpset and motor of well Nos. 40, 60 and 68.                                            | Minor repairs were attended to the pumpsets attached to the above wells.                |
| 4 Pumpset and motor of well No. 50.                                                        | The pumpsets was erected in the above well.                                             |
| 5 R.N. engine at J. Block 10 to 12 H.P.                                                    | Minor repairs to valves, governor, oil and fuel pumps were attended.                    |
| 6 Electric motor and pumpset in well Nos. 40, 50, 68, 76, 77.                              | Repairs were carried out.                                                               |
| 7 Hand operated pump of Assistant Agricultural Engineer (Mechanical) Agricultural College. | (1) Dismantled and paints, cleaned and reassembled<br>(2) gland bush and unit provided. |
| 8 Standford grinding of Assistant Agricultural Engineer, Tractor Workshops, Coimbatore.    | Repairs due to the meter and stone.                                                     |
| 9 Rock blasting unit No. V.                                                                | Cylinder head replaced—Samp of compressor welded—Minor repairs attended.                |
| 10 Wekesa oil engine.                                                                      | Valves ground it.                                                                       |
| 11 Ruston 8B, 80 engine.                                                                   | Do.                                                                                     |
| 12 D. V. oil engine at wet land well.                                                      | Rings renewed—Engine checked up and other repairs attended.                             |
| 13 D. O. Hercules engine cylinder head.                                                    | Valve—Seating cut—Valve refaced and ground it.                                          |
| 14 Electric motor well No. 60 Central Farm, Coimbatore.                                    | The repairs to 3 electric motors attended.                                              |
| 15 Rock Blasting unit III.                                                                 | Engine valves ground in and tappet adjusted.                                            |
| 16 D.D. 10 engine.                                                                         | The two batteries were charged.                                                         |
| 17 Pump at well No. 87.                                                                    | The pump set was repaired and assembled.                                                |

## APPENDIX No. 22—cont.

*Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year ending 1st July 1959 to 30th June 1960—cont.*

| Serial number. | Nature of repairs done.                                   |                                                                                                                               |
|----------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| (1)            | (2)                                                       | (3)                                                                                                                           |
|                | <i>Other Machineries—cont.</i>                            |                                                                                                                               |
| 18             | D. D. 10 engine.                                          | The batteries—2 Nos. were recharged.                                                                                          |
| 19             | Pumpset of Orchard Well, Agriculture College, Coimbatore. | Foot valve repaired and gate valve of pump set repaired.                                                                      |
| 20             | Electric motor in well No. 60, Central Farm.              | Rear action of pump set and electric motor attended to. The leakage in the suction pipe of well No. 77 checked and rectified. |
| 21             | DD7 Drill ..                                              | The two batteries of D.O. 7 Drill charged.                                                                                    |
| 22             | Oil engine and pumpset of block.                          | Necessary repairs were attended.                                                                                              |

## APPENDIX No. 23.

*List of work orders completed during the year from 1st July 1959 to 30th June 1960.*

| Serial number, work order and date. | Particulars.                                                                            | Authority.                                                       | Amount. |     |
|-------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------|---------|-----|
|                                     |                                                                                         |                                                                  | (4)     | (5) |
| 1 G. 31/1st July 1959 ..            | Overhauled the engine transmission and turning gear to the lorry MSC 9581.              | Assistant Agricultural Engineer Tractor Workshop, Coimbatore.    | 2,274   | 73  |
| 2 G. 32/1st July 1959 ..            | Refitting the silencer muffler after welding and checking up the brake of van MSY 3808. | Assistant Agricultural Engineer, (Mechanical), Coimbatore.       | 18      | 80  |
| 3 G. 33/4th July 1959 ..            | Removing and refitting the radiator after soldering of lorry MSC 9616.                  | Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.   | 20      | 48  |
| 4 G. 34/6th July 1959 ..            | Repairs to lorry MSC 9638 before brake inspection ..                                    | Do.                                                              | 164     | 80  |
| 5 G. 35/8th July 1959 ..            | Repairs to the motor in well No. 77 of Central Farm.                                    | Suprintendent, Central Farm ..                                   | 220     | 10  |
| 6 G. 36/10th July 1959 ..           | Repairs to lorry MSC 9551 ..                                                            | Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.   | 12      | 70  |
| 7 G. 37/11th July 1959 ..           | Repairing John Deere MSZ 164 ..                                                         | Suprintendent Agricultural Research Station, Tindivanam.         | 228     | 00  |
| 8 G. 38/14th July 1959 ..           | Overhauling engine of Formal Tractor ..                                                 | Director Sugaracane Breeding Station.                            | 103     | 63  |
| 9 G. 39/16th July 1959 ..           | Water pump repairs to lorry MSC 9612 ..                                                 | Assistant Agricultural Engineer (Inspection), Coimbatore.        | 4       | 94  |
| 10 G. 40/10th July 1959 ..          | Wolf valve grinder overhauling ..                                                       | Assistant Agricultural Engineer, Tractor Workshop.               | 257     | 74  |
| 11 G. 41/20th July 1959 ..          | Repairs to Stude Baker van MDC 8618 ..                                                  | Assistant Agricultural Engineer (Soil Conservation), Coimbatore. | 95      | 38  |

## APPENDIX No. 23—cont.

List of work orders completed during the year from 1st July 1959 to 30th June 1960—cont.

| Serial number, work order and date. | (1)                       | Particulars.                                                  | (2) | Authority.                                                     | (3) | Amount. | (4)   |
|-------------------------------------|---------------------------|---------------------------------------------------------------|-----|----------------------------------------------------------------|-----|---------|-------|
| 12                                  | G. 42/21st July 1959 ..   | Repairing the Vanguard van MSY 3808 ..                        | ..  | Assistant Agricultural Engineer, (Mechanical), Coimbatore.     | ..  | RS. RP. | 19 05 |
| 13                                  | G. 43/22nd July 1959 ..   | Fitting motor in well No. 42 turbine pumpset ..               | ..  | Superintendent, Central Farm, Coimbatore.                      | ..  | 26      | 75    |
| 14                                  | G. 44/25th July 1959 ..   | Repairing pumpset in well No. 68 ..                           | ..  | Do.                                                            | ..  | 14      | 06    |
| 15                                  | G. 45/27th July 1959 ..   | Repairing the motor pumpset in well No. 40 ..                 | ..  | Do.                                                            | ..  | 52      | 94    |
| 16                                  | G. 46/27th July 1959 ..   | Repairing lorry MSC 9612 ..                                   | ..  | Assistant Agricultural Engineer (Inspection), Coimbatore.      | ..  | 7       | 55    |
| 17                                  | G. 47/29th July 1959 ..   | Repairing the jeep MSZ 4203 ..                                | ..  | Do.                                                            | ..  | 69      | 84    |
| 18                                  | G. 48/29th July 1959 ..   | Repairing the lorry MSC 9551 of Tractor Workshop, Coimbatore. | ..  | Tractor Workshop, Coimbatore.                                  | ..  | 14      | 06    |
| 19                                  | G. 49/30th July 1959 ..   | Repairing the turbine pumpset of bore well No. 42.            | ..  | Superintendent, Central Farm.                                  | ..  | 146     | 80    |
| 20                                  | G. 50/8th August 1959 ..  | Repairing the pumpset of well No. 60 ..                       | ..  | Do.                                                            | ..  | 14      | 06    |
| 21                                  | G. 51/8th August 1959 ..  | Repairing the Hydraulic Service Press ..                      | ..  | Assistant Agricultural Engineer (Inspection), Tiruchirappalli. | ..  | 25      | 26    |
| 22                                  | G. 52/10th August 1959 .. | Repairing the jeep MSY 4808 ..                                | ..  | Assistant Director (Drilling), Coimbatore.                     | ..  | 9       | 88    |
| 23                                  | G. 53/11th August 1959 .. | Repairs done to lorry MSC 9585 ..                             | ..  | Assistant Agricultural Engineer (Inspection), Tiruchirappalli. | ..  | 25      | 40    |
| 24                                  | G. 53/13th August 1959 .. | Repairs done to lorry MSZ 2419 ..                             | ..  | Assistant Director (Drilling), Coimbatore.                     | ..  | 25      | 40    |
| 25                                  | G. 56/14th August 1959 .. | Dismantling the electric pumpset in well No. 68 ..            | ..  | Superintendent, Central Farm, Coimbatore.                      | ..  | 11      | 32    |
| 26                                  | G. 57/14th August 1959 .. | Dismantling and reassembling the pumpset in the well No. 60.  | ..  | Do.                                                            | ..  | 22      | 64    |

## AGRICULTURAL DEPARTMENT

|    |                              |                                                     |    |                                                                 |    |     |    |
|----|------------------------------|-----------------------------------------------------|----|-----------------------------------------------------------------|----|-----|----|
| 27 | G. 58/19th August 1959 ..    | Repairs done to Lorry MSC 9551 ..                   | .. | Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.  | .. | 12  | 62 |
| 28 | G. 59/24th August 1959 ..    | Body painting and other repairs to Jeep MSZ 4203 .. | .. | Assistant Agricultural Engineer (Inspection), Coimbatore.       | .. | 172 | 98 |
| 29 | G. 60/2nd September 1959 ..  | Repairing the oil-engine at J. Block ..             | .. | Superintendent, Central Farm, Coimbatore.                       | .. | 54  | 88 |
| 30 | G. 61/2nd September 1959 ..  | Repairs to Lorry MSC 9616 ..                        | .. | Assistant Agricultural Engineers, (Tractor Workshop).           | .. | 93  | 24 |
| 31 | G. 62/4th September 1959 ..  | Repairs to Van MSY 3808 ..                          | .. | Assistant Agricultural Engineer (Mechanical), ..                | .. | 12  | 70 |
| 32 | G. 63/7th September 1959 ..  | Jeep MSZ 5048 repairs ..                            | .. | Superintendent, Agricultural Research Station, Bhavani.         | .. | 1   | 42 |
| 33 | G. 64/7th September 1959 ..  | Repairs to Cylinder head of D4 Tractor ..           | .. | Assistant Agricultural Engineer. (Inspection), Coimbatore.      | .. | 156 | 52 |
| 34 | G. 65/10th September 1959 .. | Lorry MSC 9551 ..                                   | .. | Assistant Agricultural Engineer (Tractor Workshop).             | .. | 7   | 20 |
| 35 | G. 66/11th September 1959 .. | Repairs to Lorry MSC 2419 ..                        | .. | Assistant Director (Drilling) ..                                | .. | 118 | 82 |
| 36 | G. 67/17th September 1959 .. | Repairs to electric motor in Well No. 40 ..         | .. | Superintendent, Central Farm, Coimbatore.                       | .. | 52  | 42 |
| 37 | G. 68/12th September 1959 .. | Repairs to Jeep MDE 729 ..                          | .. | Field Manual Office, Coimbatore-3.                              | .. | 2   | 82 |
| 38 | G. 69/21st September 1959 .. | Repairs to foot valve at Well No. 50 ..             | .. | Superintendent, Central Farm, Coimbatore.                       | .. | 11  | 32 |
| 39 | G. 70/22nd September 1959 .. | Motor and pump assembly and fitting at Well No. 76. | .. | Do.                                                             | .. | 40  | 86 |
| 40 | G. 71/23rd September 1959 .. | Repairs to Jeep MDE 729 ..                          | .. | Field Manure Office, Coimbatore.                                | .. | 66  | 14 |
| 41 | G. 72/26th September 1959 .. | Repairs to Jeep MSY 4808 ..                         | .. | Assistant Director, Drilling, Coimbatore.                       | .. | 3   | 72 |
| 42 | G. 73/3rd October 1959 ..    | Repairs to Vanguard van MSY 3808 ..                 | .. | Assistant Agricultural Engineer (Mechanical).                   | .. | 439 | 12 |
| 43 | G. 74/3rd October 1959 ..    | Repairs to Lorry MSC 9616 ..                        | .. | Assistant Agricultural Engineer (Tractor Workshop), Coimbatore. | .. | 14  | 56 |

## APPENDIX No. 23—cont.

List of work orders completed during the year from 1st July 1959 to 30th June 1960—cont.

| Serial number, work order and date. | Particulars.                                                   | Authority.                                              | Amount.  |
|-------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|----------|
| (1)                                 | (2)                                                            | (3)                                                     | (4)      |
| 44 G. 75/13th October 1959          | Repairs to Jeep MDE 1231                                       | .. .. .                                                 | Rs. NP.  |
| 45 G. 76/13th October 1959          | Repairs to Jeep MSP 1809                                       | .. .. .                                                 | 4 94     |
| 46 G. 77/14th October 1959          | Bus No. MDC 9718 repairs                                       | .. .. .                                                 | 51 14    |
| 47 G. 79/15th October 1959          | Repairs to cylinder seal of D4 tractor                         | .. .. .                                                 | 12 70    |
| 48 G. 80/15th October 1959          | Repairs to D4 starting engine cylinder block                   | .. .. .                                                 | 31 62    |
| 49 G. 81/17th October 1959          | Repairs to Jeep MSC 9616                                       | .. .. .                                                 | 14 48    |
| 50 G. 82/20th October 1959          | Major overhauling of Bus MDC 9718                              | .. .. .                                                 | 15 20    |
| 51 G. 83/21st October 1959          | Repairs to electric motor and pump set in well Nos. 68 and 76. | .. .. .                                                 | 1,528 64 |
| 52 G. 84/23rd October 1959          | Repairs to Jeep MSY 4808                                       | .. .. .                                                 | .. .. .  |
| 53 G. 85/24th October 1959          | Repairs to hand-operated pump                                  | .. .. .                                                 | 9 88     |
| 54 G. 86/4th November 1959          | Repairs to Jeep MSY 4808                                       | .. .. .                                                 | 18 90    |
|                                     |                                                                | Assistant Agricultural Engineer (Drilling), Coimbatore. | 32 32    |

## ADMINISTRATION REPORT OF THE

## AGRICULTURAL DEPARTMENT

|                             |                                                          |                                                                  |                                           |
|-----------------------------|----------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------|
| 55 G. 87/4th November 1959  | Replacement of parts supplied by party of Jeep MSP 1809. | Assistant Agricultural Engineer (Soil Conservation), Coimbatore. | 4 94                                      |
| 56 G. 88/5th November 1959  | Major overhauling of Lorry MSC 9612                      | Assistant Agricultural Engineer (Inspection), Coimbatore.        | Value for certain items available. 344 86 |
| 57 G. 89/7th November 1959  | Repairs to Vanguard van MSY 3803                         | Assistant Agricultural Engineer (Mechanical).                    | 4 94                                      |
| 58 G. 90/13th November 1959 | Repairs to Lorry MSZ 9348                                | Director, Agricultural Officer, Salem.                           | 174 48                                    |
| 59 G. 91/14th November 1959 | Repairs to Lorry MSC 9638                                | Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.  | 126 48                                    |
| 60 G. 92/18th November 1959 | Repairs to Lorry MSC 9551                                | Do.                                                              | Value for certain items awarded. 11 32    |
| 61 G. 94/18th November 1959 | Repairs to Lorry MSC 9616                                | Do.                                                              | 11 32                                     |
| 62 G. 93/18th November 1959 | Repairs to Lorry MSZ 2419                                | Assistant Director (Drilling), Coimbatore.                       | 32 48                                     |
| 63 G. 95/21st November 1959 | Refacing of 8 valves of D7 7M 8078 Tractor               | Assistant Agricultural Engineer (Inspection) Coimbatore.         | 69 71                                     |
| 64 G. 96/26th November 1959 | Repairs to Jeep MSY 4808                                 | Assistant Director (Drilling), Coimbatore.                       | 300 82                                    |
| 65 G. 97/26th November 1959 | Repairs to DD7 engine                                    | Do.                                                              | 28 40                                     |
| 66 G. 93/1st December 1959  | Repairs to electric motor in Well No. 50                 | Superintendent, Central Farm, Coimbatore.                        | 17 67                                     |
| 67 G. 100/2nd December 1959 | Repairs to Jeep MSY 808                                  | Assistant Director, Drilling, Coimbatore.                        | 22 62                                     |
| 68 G. 101/2nd December 1959 | Service of casual mazdoor                                | Assistant Agricultural Engineer, (Research).                     |                                           |
| 69 G. 102/2nd December 1959 | Repairs to standford grinding stone                      | Assistant Agricultural Engineer (Tractor Workshop),              |                                           |

## APPENDIX No. 23—cont.

List of work orders completed during the year from 1st July 1959 to 30th June 1960—cont.

| Serial number, work order and date. | Particulars.                                                                                                                         | Authority.                                                               | Amount.                              |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------|
| (1)                                 | (2)                                                                                                                                  | (3)                                                                      | (4)<br>RS. NP.                       |
| 70 G. 103/3rd December 1959 ..      | Repairs to Jeep MDE 1231 ..                                                                                                          | District Agricultural Officer<br>Coimbatore.                             | 28 62                                |
| 71 G. 105/12th December 1959 ..     | Repairs to Van MSY 3808 ..                                                                                                           | Assistant Agricultural Engineer<br>(Mechanical) Coimbatore.              | 76 78                                |
| 72 G. 106/14th December 1959 ..     | Repairs to Jeep MSZ 5048 ..                                                                                                          | Superintendent, Agricultural<br>Research Station, Bhavani-<br>sagar.     | 15 42                                |
| 73 G. 107/15th December 1959 ..     | Repairs to Lorry MSC 9638 ..                                                                                                         | Assistant Agricultural Engineer<br>(Tractor Workshop).                   | 45 42                                |
| 74 G. 110/22nd December 1959 ..     | Repairs to Jeep MDE 729 ..                                                                                                           | Field Manure Officer, Coimba-<br>tore.                                   | 15 38                                |
| 75 G. 112/24th December 1959 ..     | Repairs to Jeep MDC 7879 ..                                                                                                          | Soil Survey Officer, Coimba-<br>tore.                                    | 20 46                                |
| 76 G. 113/28th December 1959 ..     | Repairs to Van MSY 3808 ..                                                                                                           | Assistant Agricultural Engineer<br>(Mechanical.)                         | 13 04                                |
| 77 G. 114/20th December 1959 ..     | Repairs to Van MSY 3808 ..                                                                                                           | Do.                                                                      | Value still<br>awaited<br>from firm. |
| 78 G. 115/29th December 1959 ..     | Repairs to Jeep MSP 1809 ..                                                                                                          | Assistant Agricultural Engineer<br>(Soil Conservation), Coimba-<br>tore. | 39 68                                |
| 79 G. 116/2nd January 1960 ..       | Jeep MSZ 5048 renewing oil retainer and relax<br>bearing—soldering radiator—fitting up Ignition<br>switch—checking universal joints. | Superintendent Agricultural<br>Research Station, Bhavani-<br>sagar.      | 3 63                                 |
| 80 G. 117/2nd January 1960 ..       | College orchard well repairs to electric motor ..                                                                                    | Superintendent Central, Farm.                                            | 79 24                                |
| 81 G. 118/4th January 1960 ..       | Bus MDC 9718 rectifying starting trouble ..                                                                                          | Assistant Agricultural Engineer,<br>(Mechanical.)                        | 2 05                                 |
| 82 G. 119/5th January 1960 ..       | Van MSY 3808 General tune up and wheel align-<br>ment.                                                                               | Do.                                                                      | 4 94                                 |
| 83 G. 120/6th January 1960 ..       | MSC 9581 Lorry—renew studs in rear-wheel minor<br>repairs.                                                                           | Assistant Agricultural Engineer<br>(Tractor Workshop).                   | 53 72                                |
| 84 G. 121/5th January 1960 ..       | Jeep MDC 3362—Renew Speedometer inner and<br>outer cable.                                                                            | District Agricultural Officer,<br>Erode.                                 | 55 34                                |
| 85 G. 122/12th January 1960 ..      | Rock Blasting unit No. V. (1) Replace cylinder<br>head (2) weld sum of compressor and minor<br>repairs.                              | Assistant Director (Drilling),<br>Coimbatore.                            | 81 07                                |
| 86 G. 123/12th January 1960 ..      | MDC 3362 (1) renew oil seals, (2) Renew pinion<br>seals (3) adjust brakes and (4) check up<br>universal joints.                      | District Agricultural Officer,<br>Erode.                                 | 80 06                                |
| 87 G. 124/16th January 1960 ..      | Repairs to electric motor in Well No. 68 ..                                                                                          | Farm Manager Eastern<br>block Central Farm,<br>Coimbatore.               | 294 18                               |
| 88 G. 125/20th January 1960 ..      | MSC 9616 Lorry—repairs water pump insulate<br>frayed wires.                                                                          | Assistant Agricultural Engineer<br>(Tractor Workshop).                   | 25 98                                |
| 89 G. 126/22nd January 1960 ..      | MSC 9551 Lorry minor repairs ..                                                                                                      | Do.                                                                      | 286 75                               |
| 90 G. 127/22nd January 1960 ..      | MSC 9531 Lorry body painting ..                                                                                                      | Do.                                                                      | 221 06                               |
| 91 G. 128/22nd January 1960 ..      | MSC 9638 Overhaul self-starter and tune up<br>engine.                                                                                | Do.                                                                      | 13 60                                |
| 92 G. 129/22nd January 1960 ..      | MSZ 4203 Jeep Stock leak in petrol tank, (2) ad-<br>just brakes and (3) overhauling of steering.                                     | Assistant Agricultural Engineer<br>(Inspection), Coimbatore.             | 95 93                                |
| 93 G. 130/23rd January 1960 ..      | Well No. 60 repairs to foot valve ..                                                                                                 | Farm Manager, Western block.                                             | 32 84                                |
| 94 G. 131/29th January 1960 ..      | Wenkesa cylinder head-grind in valves ..                                                                                             | Assistant Director (Drilling)<br>Coimbatore.                             | 25 96                                |
| 95 G. 132/30th January 1960 ..      | Ruston 2 V.S.O. Engine grind in valves ..                                                                                            | Do.                                                                      | 123 96                               |
| 96 G. 133/1st February 1960 ..      | MSZ 4203 Jeep tune engine and (2) repairing the<br>radiator.                                                                         | Assistant Agricultural Engineer<br>(Inspection), Coimbatore.             | 6 60                                 |
| 97 G. 134/2nd February 1960 ..      | MSC 9638 Lorry Engine tune up brake over-<br>hauling.                                                                                | Do.                                                                      | 218 57                               |
| 98 G. 135/2nd February 1960 ..      | Bus MDC 9718 Check leak in water pump check<br>engine and do necessary repair.                                                       | Assistant Agricultural Engineer<br>(Mechanical.)                         | 68 26                                |



**APPENDIX No. 23—cont.**  
*List of work orders completed during the year from 1st July 1959 to 30th June 1960—cont.*

| Serial number, work order and date. | Particulars.                                                                                                                          | Authority.                                                      | Amount. |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------|
| (1)                                 | (2)                                                                                                                                   | (3)                                                             | (4)     |
| 150 G. 26/1960-61/27th May 1960.    | D 6 cylinder head—2 Nos. (1) Grinder in valves (2) Renew valves guide, (3) renew valves, (4) Renew valve seat in rts.                 | Assistant Director, Drilling, Salem.                            | 76 38   |
| 151 G. 27/1960-61/3rd May 1960.     | MSC 9583 Lorry (1) Repairs to the front mudguard frame of MSC 1583 (2) Replace drum stud for steering wheel.                          | Assistant Director, Drilling, Salem.                            | 18 64   |
| 152 G. 28/1960-61/31st May 1960.    | Lorry MSC 9333 (1) Renew Main leaf for front right spring (2) renew centre bolt.                                                      | Assistant Agricultural Engineer (Tractor Workshop). Do.         | 54 72   |
| 153 G. 29/1960-61/1st June 1960.    | MSC 9581 Lorry repair before brake Inspection (1) Tune up engine (2) Adjust brake, (3) Renew oil seal for wheel, (4) check a.c. pump. | Do.                                                             | 63 55   |
| 154 G. 30/1960-61/5th June 1960.    | Orchard well. (1) Repair foot valve (2) Gate valve of the pump set repaired.                                                          | Farm Manager Western block central Farm, Coimbatore.            | 53 92   |
| 155 G. 31/1960-61/8th June 1960.    | Well 69—Re-connecting the electric motor and pump set removing the old one.                                                           | Do.                                                             | 23 20   |
| 156 G. 33/1960-61/10th June 1960.   | Van MDN 4 76 (1) Tune up engine, (2) Check and rectify the defects in self-starter, (3) Fit a new horn (4) Fit up a new sealed beam.  | Assistant Agricultural Engineer (Soil Conservation) Outstation. | 34 71   |
| 157 G. 32/1960-61/8th June 1960.    | Well 77—To check and rectify leakage in suction pipe.                                                                                 | Farm Manager Western block, Central Farm.                       | 58 40   |
| 158 G. 35/1960-61/24th June 1960.   | DD7 Engine batteries charging the batteries—2 ..                                                                                      | Assistant Agricultural Engineer (Inspection), Coimbatore.       | 6 00    |

## APPENDIX No. 24.

*Statement showing the pests of crops tackled and savings effected during the year 1959-60.*

## (a) FOR NORTHERN REGION.

| Crop and pest.                             | Control measures adopted.                                                                                  | Area tackled. | P. centage of infestation. | Quantity saved in tons. | Money value |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------|----------------------------|-------------------------|-------------|
| (1)                                        | (2)                                                                                                        | (3)           | (4)                        | (5)                     | (6)         |
|                                            |                                                                                                            |               | PER CENT.                  |                         | RS.         |
| <b>Paddy—</b>                              |                                                                                                            |               |                            |                         |             |
| Schoenobia incertulas W. (stem borer).     | Spraying Folidol at 1 oz. in 12½ gallons of water or BHC 50 per cent W.P. at 1 lb. in 13 gallons of water. | 92,807        | 20                         | 3,437                   | 10,31,100   |
| Nephotettix bipunctatus F. (green jassid). | Dusting DDT 5 per cent dust.                                                                               | 24,348        | 20                         | 902                     | 2,70,600    |
| Tettigoniella spectrata D. (White jassid). | Dusting BHC 10 per cent dust.                                                                              | 9,391         | 20                         | 348                     | 1,04,400    |
| Green and white jassid.                    | Dusting a mixture of BHC 10 per cent and DDT 5 per cent dust.                                              | 1,01,077      | 20                         | 3,744                   | 11,23,200   |
| Leptocorisa acuta T. (Rice sheath bug).    | Dusting BHC 10 per cent dust.                                                                              | 2,907         | 20                         | 108                     | 32,400      |
| Thrips oryzae W. (Thrips).                 | Do.                                                                                                        | 1,806         | 20                         | 67                      | 20,100      |
| Ripisid oryzae G. (May bug)                | Spraying Folidol 1 oz. in 6½ gallons of water.                                                             | 12,364        | 20                         | 458                     | 1,37,400    |
| Nymphula depunctalis G. (Cose worm).       | Dusting BHC 10 per cent dust.                                                                              | 7,210         | 20                         | 267                     | 80,100      |
| Nilaparvata lugens St. (Fulgid).           | Do.                                                                                                        | 2,401         | 20                         | 89                      | 26,700      |
| Spiloptera mauritia B. (Army worm).        | Spraying BHC 50 per cent or W.P. (0.5) or DDT 50 per cent W.P. (0.1 per cent).                             | 131           | 20                         | 5                       | 1,500       |
| Scotinophora livida (black bug).           | Dusting BHC 10 per cent.                                                                                   | 20            | 20                         | 1                       | 300         |
| Grass hopper ..                            | Do.                                                                                                        | 28            | 20                         | 1                       | 300         |
| Chaphalocrosis medialis G. (flat roach).   | Do.                                                                                                        | 10,792        | 20                         | 400                     | 1,200       |
| Tetradia histrioides F. (Numavaadu).       | Do.                                                                                                        | 25            | 20                         | 1                       | 300         |
| Rats ..                                    | Baiting with zinc phosphide 5 per cent.                                                                    | 10,742        | 5                          | 398                     | 1,19,400    |
| Paddy butterfly ..                         | Dusting BHC 10 per cent dust.                                                                              | 314           | 20                         | 12                      | 3,600       |
| Stem borer and jassids.                    | Application of BHC 50 per cent W.P. (0.05 per cent and DDT 50 per cent W.P. (0.1 per cent).                | 50            | 20                         | 2                       | 600         |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Crop and pest.                                 | Control measures adopted.                                     | Area tackled. | Percentage of infestation. | Quantity saved. | Money value. |
|------------------------------------------------|---------------------------------------------------------------|---------------|----------------------------|-----------------|--------------|
| (1)                                            | (2)                                                           | (3)           | (4)                        | (5)             | (6)          |
|                                                | ACS.                                                          | PER CENT.     |                            |                 | RS.          |
| <b>Paddy—cont.</b>                             |                                                               |               |                            |                 |              |
| Atherigona sp ..                               | Dusting BHC 10 per cent dust.                                 | 3,718         | 20                         | 138             | 41,400       |
| Pachytiplosis oryzae W. (Gall fly).            | Spraying BHC. 50 per cent W.P. (0.05 per cent).               | 706           | 20                         | 26              | 7,800        |
| <b>Millet—</b>                                 |                                                               |               |                            |                 |              |
| <b>Cholam—</b>                                 |                                                               |               |                            |                 |              |
| Calocoris angustatus L. (Cholam ear head bug). | Dusting BHC. 10 per cent dust.                                | 22,898        | 20                         | 848             | 1,86,760     |
| Oligonychus indicus H. (Cholam mite).          | Dusting Sulphur dust.                                         | 113           | 20                         | 4               | 880          |
| Chilo zonellus S. (Stem-borer).                | Spraying BHC. 50 per cent W.P.                                | 71            | 20                         | 2½              | 550          |
| Rats .. .. .                                   | Baiting with Zincphosphide.                                   | 77            | 5                          | 3               | 660          |
| Heliothis arimigera Hb.                        | Spraying BHC 50 per cent W.P.                                 | 714           | 20                         | 26½             | 5,720        |
| Leaf eating caterpillar.                       | Do.                                                           | 20            | 20                         | 1               | 220          |
| <b>Ragi—</b>                                   |                                                               |               |                            |                 |              |
| Laphygma exigua Hb. (Cutworm).                 | Dusting DDT 5 per cent dust.                                  | 277           | 20                         | 10              | 2,200        |
| Sesamia inferans W. (Stem borer).              | Spraying BHC 50 per cent W.P.                                 | 2,022         | 20                         | 25              | 16,500       |
| Flea beetle .. ..                              | Dusting BHC. 10 per cent dust.                                | 200           | 20                         | 7½              | 1,650        |
| Jassids .. .. .                                | Do.                                                           | 947           | 20                         | 35              | 7,700        |
| Thrips .. .. .                                 | Do.                                                           | 2,114         | 20                         | 78½             | 17,270       |
| Tertraneura hirsuta B. (Root aphids).          | Drenching the soil with BHC 50 per cent W.P. (0.05 per cent). | 317           | 20                         | 12              | 2,640        |
| Grass-hopper .. ..                             | Dusting BHC. 10 per cent dust.                                | 4             | 20                         | 1/7             | 31           |
| Schizaphis graminum R. (Aphids)                | Do.                                                           | 173           | 20                         | 6½              | 1,435        |
| Jassids and caterpillar.                       | Spraying Endrin (0.02 per cent).                              | 115           | 20                         | 4½              | 930          |
| <b>Samai—</b>                                  |                                                               |               |                            |                 |              |
| Out worm .. .. .                               | Application of DDT. 50 per cent W.P. (0.1 per cent).          | 656           | 20                         | 24½             | 5,325        |

## APPENDIX No. 24—cont.

Statement showing pests of crops tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Crop and pests.                        | Control measures adopted.                            | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money value. |
|----------------------------------------|------------------------------------------------------|---------------|----------------------------|-------------------------|--------------|
| (1)                                    | (2)                                                  | (3)           | (4)                        | (5)                     | (6)          |
|                                        | ACS.                                                 | PER CENT.     |                            |                         | RS.          |
| <b>Millet—cont.</b>                    |                                                      |               |                            |                         |              |
| <b>Tenai—</b>                          |                                                      |               |                            |                         |              |
| Cricket .. .. .                        | Dusting DDT 5 per cent dust.                         | 18            | 20                         | ½                       | 110          |
| <b>Vegetables—</b>                     |                                                      |               |                            |                         |              |
| Brinjal—Epilachna beetle.              | Application of calcium arsenate and lime 1:4.        | 8,701         | 20                         | 967                     | 2,70,760     |
| Jassids .. .. .                        | Applying DDT 5 per cent dust.                        | 40            | 20                         | 4½                      | 1,260        |
| Leucinodes orbonalis G. (Shoot borer). | Spraying DDT 50 per cent W.P. (0.1 per cent).        | 507           | 20                         | 56½                     | 15,820       |
| Tetranychus telarius L. (Mite)         | Applying sulphur dust.                               | 570           | 20                         | 63½                     | 17,780       |
| Borer and Jassid ..                    | Spraying Endrin (0.02 per cent).                     | 83            | 20                         | 9½                      | 2,590        |
| Epilachna and Mealy bug.               | Spraying foliol at 1 oz. in 6½ gallons of water.     | 7             | 20                         | 1                       | 280          |
| Epilachna and shoot borer.             | Spraying Endrin (0.02 per cent).                     | 267           | 20                         | 30                      | 8,400        |
| Leucinodes orbonalis (Fruit borer).    | Do.                                                  | 188           | 20                         | 21                      | 5,880        |
| <b>Bendai—</b>                         |                                                      |               |                            |                         |              |
| Jassid .. .. .                         | Applying DDT 5 per cent dust.                        | 41            | 20                         | 9½                      | 2,660        |
| Fruit borer .. ..                      | Spraying Endrin (2.02 per cent).                     | 155           | 20                         | 17½                     | 4,830        |
| <b>Cabbage—</b>                        |                                                      |               |                            |                         |              |
| Cut worm .. .. .                       | Application of DDT 50 per cent W.P. (0.1 per cent).  | 199           | 20                         | 22                      | 6,160        |
| Borer .. .. .                          | Spraying Endrin 0.02 per cent.                       | 7             | 20                         | 1                       | 280          |
| Leaf eating caterpillar.               | Do.                                                  | 424           | 20                         | 47                      | 13,160       |
| <b>Potato—</b>                         |                                                      |               |                            |                         |              |
| Agrotis ypsilon R. Cut worm.           | Application of DDT. 50 per cent W.P. (0.1 per cent). | 1,551         | 20                         | 172½                    | 48,230       |
| Chafer grubs .. ..                     | Dusting DDT 5 per cent dust.                         | 461           | 20                         | 51½                     | 14,350       |
| Weevils .. .. .                        | Spraying DDT 50 per cent W.P. (0.1 per cent).        | 22            | 20                         | 2½                      | 700          |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Crop and pest.                            | Control measures adopted.                                    | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money value. |
|-------------------------------------------|--------------------------------------------------------------|---------------|----------------------------|-------------------------|--------------|
| (1)                                       | (2)                                                          | (3)           | (4)                        | (5)                     | (6)          |
|                                           | ACS.                                                         |               | PER CENT.                  |                         | RS.          |
| Vegetables—cont.                          |                                                              |               |                            |                         |              |
| Potato—cont.                              |                                                              |               |                            |                         |              |
| Tuber moths                               | Dusting DDT. 5 per cent dust over bags.                      | 1,514 bags.   | 5                          | ..                      | ..           |
| Rats                                      | Baiting with zinc phosphide.                                 | 903           | 5                          | 100½                    | 28,070       |
| Epilachna beetle                          | Application of Calcium arsenate + lime (1:4).                | 352           | 20                         | 80                      | 24,920       |
| Peas—                                     |                                                              |               |                            |                         |              |
| Aphids                                    | Spraying Endrin (0.02 per cent).                             | 242           | 20                         | 27                      | 7,560        |
| Onion—                                    |                                                              |               |                            |                         |              |
| Thrips                                    | Spraying BHC. 5 per cent W.P. (0.05 per cent).               | 1,098         | 20                         | 122                     | 34,160       |
| Beans—                                    |                                                              |               |                            |                         |              |
| Aphids                                    | Spraying endrin (0.02 per cent).                             | 243           | 20                         | 27                      | 7,560        |
| Tomato—                                   |                                                              |               |                            |                         |              |
| Fruit borer                               | Spraying DDT. 5 per cent W.P. (0.01 per cent).               | 190           | 20                         | 21                      | 5,880        |
| Misc. Vegetables—                         |                                                              |               |                            |                         |              |
| Caterpillar, etc.                         | Aphids. Spraying Endrin. 1 oz. in 64 gallons of water.       | 197           | 20                         | 22                      | 6,160        |
| Banana—                                   |                                                              |               |                            |                         |              |
| Rhizome weevil                            | Drenching the soil with DDT 50 per cent W.P. (0.1 per cent). | 5             | 20                         | 5                       | 250          |
| Pulses—                                   |                                                              |               |                            |                         |              |
| Red gram—                                 |                                                              |               |                            |                         |              |
| Podborer                                  | Application of DDT. 5 per cent dust.                         | 9             | 20                         | 1/3                     | 100          |
| Oilseed crops—                            |                                                              |               |                            |                         |              |
| Groundnut—                                |                                                              |               |                            |                         |              |
| Thrips                                    | Dusting BHC. 10 per cent dust.                               | 2,100         | 20                         | ..                      | 1,05,000     |
| Aphis oracivora L. (Aphids)               | Dusting BHC. 10 per cent dust.                               | 4,768         | 20                         | ..                      | 2,38,300     |
| Stomateryz sybs civella Sell (Surulpuchi) | Dusting DDT. 5 per cent dust.                                | 9,283         | 20                         | ..                      | 4,64,160     |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Crop and pest.                                    | Control measures adopted.                                                                                        | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money value. |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|-------------------------|--------------|
| (1)                                               | (2)                                                                                                              | (3)           | (4)                        | (5)                     | (6)          |
|                                                   | ACS.                                                                                                             |               | PER CENT.                  |                         | RS.          |
| Oil seeds—cont.                                   |                                                                                                                  |               |                            |                         |              |
| Groundnut—cont.                                   |                                                                                                                  |               |                            |                         |              |
| Amsacta albistriga M. (Red hairy caterpillar).    | Dusting BHC. 10 per cent dust in the early stages and Folidol 25 per cent spray at later stages.                 | 16,412        | 20                         | ..                      | 8,20,600     |
| Cutworm                                           | Dusting DDT. 5 per cent dust.                                                                                    | 13            | 20                         | ..                      | 650          |
| Thrips and Surulpuchi                             | Dusting DDT. 5 per cent dust.                                                                                    | 1,172         | 20                         | ..                      | 58,600       |
| Red hairy caterpillar and Surulpuchi              | Dusting a mixture of DDT. 5 per cent and BHC. 10 per cent dust.                                                  | 432           | 20                         | ..                      | 31,600       |
| Gingelly—                                         |                                                                                                                  |               |                            |                         |              |
| Amsacta albistriga M. (Red hairy caterpillar)     | Dusting BHC. 10 per cent.                                                                                        | 570           | 20                         | ..                      | 28,500       |
| Castor—                                           |                                                                                                                  |               |                            |                         |              |
| Achoea junata L. (Somil borer)                    | Spraying Endrin 1 oz. in 4 gallons of water.                                                                     | 556           | 20                         | ..                      | 27,800       |
| Dichroscia .. (Capule borer)                      | Applying DDT. 5 per cent dust.                                                                                   | 135           | 20                         | ..                      | 6,750        |
| Coconuts—                                         |                                                                                                                  |               |                            |                         |              |
| Oryctes rhinoceros L. (Rhinoceros beetle)         | Hooking out the beetle and application of BHC. 10 per cent dust + sand (1:1).                                    | 3,606 Nos.    | 20                         | ..                      | 7,212        |
| Nephantis serinopa M. (Black headed Caterpillar.) | Spraying DDT. 50 per cent W.P. (0.2 per cent) By releasing parasites                                             | 14,130        | 20                         | ..                      | 28,260       |
| Nephantis and Rhinoceros                          | By spraying DDT. 50 per cent W.P. and hooking out beetle and application of BHC. 10 per cent dust and sand (1:1) | 25,320        | 20                         | ..                      | 50,640       |
|                                                   |                                                                                                                  | 240           | 20                         | ..                      | 480          |
| Drugs and Narcotics—                              |                                                                                                                  |               |                            |                         |              |
| Chillies—                                         |                                                                                                                  |               |                            |                         |              |
| Scirtothrips dorsalis H. (Thrips)                 | Spraying BHC. 50 per cent W.P. (0.05 per cent).                                                                  | 16,103        | 20                         | ..                      | 8,05,400     |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

(a) FOR NORTHERN REGION—cont.

| Crop and pest.                                       | Control measures adopted.                                 | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money value. |
|------------------------------------------------------|-----------------------------------------------------------|---------------|----------------------------|-------------------------|--------------|
| (1)                                                  | (2)                                                       | (3)           | (4)                        | (5)                     | (6)          |
|                                                      |                                                           |               | PER CENT.                  |                         | RS.          |
| <b>Drugs and Narcotics—cont.</b>                     |                                                           |               |                            |                         |              |
| <b>Chillies—cont.</b>                                |                                                           |               |                            |                         |              |
| <i>Prodenia litura</i> F. (Fruit borer)              | Spraying BHC. 50 per cent W.P. (0.05 per cent).           | 1,123         | 20                         | ..                      | 56,150       |
| <i>Amsacta albistriga</i> M. (Red hairy caterpillar) | Dusting BHC. 10 per cent dust.                            | 20            | 20                         | ..                      | 1,000        |
| <b>Tobacco—</b>                                      |                                                           |               |                            |                         |              |
| <i>Myzus persicae</i> (Aphids)                       | Spraying Endrin (0.02 per cent).                          | 939           | 20                         | ..                      | 46,950       |
| <i>Prodenia litura</i> F.                            | Do.                                                       | 6             | 20                         | ..                      | 300          |
| <b>Coffee—</b>                                       |                                                           |               |                            |                         |              |
| <i>Lecanium viride</i> G. (Green bug)                | Spraying folidol 1 oz. in 25 gallons.                     | 560           | 20                         | ..                      | 28,000       |
| Leaf eating caterpillar                              | Do.                                                       | 60            | 20                         | ..                      | 3,000        |
| <i>Zenzora coffeae</i> (Stem-borer)                  | Smearing BHC. 50 per cent at 1 lb. in 5 gallons of water. | 159           | 20                         | ..                      | 7,950        |
| <b>Tea—</b>                                          |                                                           |               |                            |                         |              |
| Tea Mosquito ..                                      | Spraying DDT. 50 per cent W.P. (0.1 per cent).            | 289           | 20                         | ..                      | 14,450       |
| Rats ..                                              | Baiting with Zinc phosphide.                              | 4             | 5                          | ..                      | 200          |
| <b>Betelvine—</b>                                    |                                                           |               |                            |                         |              |
| <i>Disphinctus politus</i> W. (Betelvine bug)        | Spraying DDT. 50 per cent W.P. (0.1 per cent.)            | 77            | 20                         | ..                      | 3,850        |
| <b>Fibre crop—</b>                                   |                                                           |               |                            |                         |              |
| <b>Cotton—</b>                                       |                                                           |               |                            |                         |              |
| Jassids ..                                           | Application of Endrin (0.02 per cent.)                    | 5,625         | 20                         | ..                      | 2,81,250     |
| <i>Aphis gossypii</i> G (Aphids)                     | Do.                                                       | 6,365         | 20                         | ..                      | 3,18,250     |
| <i>Platyedra gossypiella</i> (Bollworm)              | Spraying Folidol (0.025 per cent.)                        | 7,483         | 20                         | ..                      | 3,74,150     |
| <i>Sylepta derogata</i> F. (Leaf roller)             | Dusting BHC. 10 per cent dust.                            | 3,126         | 20                         | ..                      | 1,56,300     |
| <i>Pseudococcus virgatus</i> C. (Mealy bugs)         | Spraying Folidol at 1 oz. in 6½ gallons of water.         | 742           | 20                         | ..                      | 37,100       |
| <i>Comopila erosa</i> H. (Semilooper)                | Dusting BHC. 10 per cent.                                 | 25            | 20                         | ..                      | 1,250        |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

(a) FOR NORTHERN REGION—cont.

| Crop and pest.                                                            | Control measures adopted.                       | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|---------------------------------------------------------------------------|-------------------------------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                                                                       | (2)                                             | (3)           | (4)                        | (5)                     | (6)                     |
|                                                                           |                                                 | ACS.          | PER CENT.                  |                         | RS.                     |
| <b>Fire crop—cont.</b>                                                    |                                                 |               |                            |                         |                         |
| <b>Cotton—cont.</b>                                                       |                                                 |               |                            |                         |                         |
| Jassids and Aphids.                                                       | Spraying Endrin (0.02 per cent).                | 577           | 20                         | ..                      | 28,850                  |
| <i>Heliothus armigera</i> Hb. (Gram eater-pillar)                         | Spraying DDT. 50 per cent W.P. (0.02 per cent). | 85            | 20                         | ..                      | 4,250                   |
| Aphids and leafroller                                                     | Spraying Endrin (0.02 per cent).                | 82            | 20                         | ..                      | 4,100                   |
| Aphids, Jassids, Bollworm, Heliothus, etc. Jassids, Bollworm, Mealy bugs. | Spraying Folidol (0.025 per cent).              | 10,356        | 20                         | ..                      | 5,17,800                |
|                                                                           | Do.                                             | 1,780         | 20                         | ..                      | 89,000                  |
| Bollworm, Jassids, aphids.                                                | Do.                                             | 5,421         | 20                         | ..                      | 2,71,050                |
| <b>Sugars—</b>                                                            |                                                 |               |                            |                         |                         |
| <b>Sugarcane—</b>                                                         |                                                 |               |                            |                         |                         |
| <i>Chilotræa infuscatella</i> Sn. (Early shoot borer)                     | Spraying DDT. 50 per cent W.P. (0.25 per cent). | 2,485         | 20                         | 7455                    | 2,23,650                |
| <b>Fruit trees and other economic trees—</b>                              |                                                 |               |                            |                         |                         |
| <b>Mango—</b>                                                             |                                                 |               |                            |                         |                         |
| <i>Idiocerus niveosparsus</i> L. (Mango hopper)                           | Spraying DDT. 50 per cent W.P. (0.1 per cent).  | 62,339        | 20                         | ..                      | 1,24,678                |
| <i>Orthaga exvinacea</i> W. (Leaf webber)                                 | Spraying BHC. 50 per cent. (0.05 per cent).     | 30            | 20                         | ..                      | 60                      |
| Mealy bugs and Scales                                                     | Spraying Folidol 1 oz 6½ gallons. of water.     | 125           | 20                         | ..                      | 250                     |
| <b>Guava—</b>                                                             |                                                 |               |                            |                         |                         |
| Mealy bugs ..                                                             | Do.                                             | 1,215         | 20                         | ..                      | 2,430                   |
| <i>Dacus feruginens</i> F. (Fruit fly)                                    | Spraying DDT 50 per cent (0.1 per cent)         | 600           | 20                         | ..                      | 1,200                   |
| <b>Citrus—</b>                                                            |                                                 |               |                            |                         |                         |
| <b>Toxoptera—</b>                                                         |                                                 |               |                            |                         |                         |
| <i>Citricidus K and T aurenti</i> BdF. (Aphid)                            | Spraying Endrin (0.02 per cent)                 | 770           | 20                         | ..                      | 1,540                   |
| <i>Papilio demoleus</i> L. (Leaf eating Caterpillar)                      | Spraying BHC 50 per cent W.P. (0.05 per cent)   | 892           | 20                         | ..                      | 1,784                   |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Crop and pest.                                 | Control measures adopted.                        | Area tackled.    | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|------------------------------------------------|--------------------------------------------------|------------------|----------------------------|-------------------------|-------------------------|
| (1)                                            | (2)                                              | (3)              | (4)                        | (5)                     | (6)                     |
|                                                |                                                  | ACS.             | PER CENT.                  |                         | RS.                     |
| Fruit trees and other economic trees—cont.     |                                                  |                  |                            |                         |                         |
| Citrus—                                        |                                                  |                  |                            |                         |                         |
| Toxoptera—cont.                                |                                                  |                  |                            |                         |                         |
| Phyllocnistis citrella S. (Leaf miner)         | Spraying DDT 50 per cent W.P. (0.01 per cent)    | 571              | 20                         | ..                      | 1,142                   |
| Aphids and leaf miner.                         | Spraying Endrin (0.02 per cent)                  | 185              | 20                         | ..                      | 370                     |
| Aphids and leaf eating caterpillar             | Do.                                              | 198              | 20                         | ..                      | 396                     |
| Jack—                                          |                                                  |                  |                            |                         |                         |
| Margoronia Caesaha W. (Fruit borer)            | Spraying DDT 50 per cent W.P. (0.1 per cent)     | 70               | 20                         | .                       | 140                     |
| Cashew—                                        |                                                  |                  |                            |                         |                         |
| Thrips                                         | Spraying BHC 50 per cent W.P. (0.05 per cent)    | 1,127            | 20                         | ..                      | 2,254                   |
| Semilooper .. ..                               | Do. ..                                           | 25               | 20                         | ..                      | 50                      |
| Thrips and Leaf eating caterpillar             | Spraying Endrin (0.02 per cent)                  | 6,250            | 20                         | ..                      | 12,500                  |
| Pears—                                         |                                                  |                  |                            |                         |                         |
| Scales .. ..                                   | Spraying Folidol at 1 oz. in 6½ gallons of water | 4,197            | 20                         | ..                      | 8,394                   |
| Grape vine—                                    |                                                  |                  |                            |                         |                         |
| Scelodonta strigi collis M (Flea beetle) .. .. | Spraying DDT 50 per cent (0.2 per cent)          | 33Ac.            | 20                         | ..                      | 1,650                   |
| Other plants and flower plants—                |                                                  |                  |                            |                         |                         |
| Scales, Aphids, mealy bugs, etc.               | Spraying folidol ..                              | 1,254 }<br>Ac. } | 20                         | ..                      | 1,254                   |

## (b) FOR SOUTHERN REGION.

|                                        |                                                                                                |           |    |       |           |
|----------------------------------------|------------------------------------------------------------------------------------------------|-----------|----|-------|-----------|
| Paddy—                                 |                                                                                                |           |    |       |           |
| Schoenobius incertelus (Stemborer).    | Spraying Parathion 20 E.C. at 1 oz. in 12½ gallons pr. BHC 50 per cent at 1 lb. in 13 gallons. | 94,090.25 | 20 | 3,485 | 10,45,500 |
| Tettigoniella spectra (White Jassids). | Dusting 10 per cent BHC.                                                                       | 15,665.90 | 20 | 580   | 1,74,000  |
| Nephotettix bipunctus (Green Jassids). | Dusting 5 per cent DDT.                                                                        | 30,162.50 | 20 | 1,043 | 3,12,900  |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (b) FOR SOUTHERN REGION—cont.

| Crop and pest.                           | Control measures adopted.                                  | Area tackled.   | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|------------------------------------------|------------------------------------------------------------|-----------------|----------------------------|-------------------------|-------------------------|
| (1)                                      | (2)                                                        | (3)             | (4)                        | (5)                     | (6)                     |
|                                          |                                                            | ACS.            | PER CENT.                  |                         | RS.                     |
| Paddy—cont.                              |                                                            |                 |                            |                         |                         |
| Green and White Jassids.                 | Dusting the mixture of 5 per cent DDT and 10 per cent BHC. | 7,752           | 20                         | 287                     | 86,100                  |
| Leptocorisa acuta (Ear head bug).        | Dusting 10 per cent BHC.                                   | 18,167          | 20                         | 673                     | 2,01,900                |
| Thrips oryzae (Thrips).                  | Dusting 10 per cent BHC.                                   | 22,866.50       | 20                         | 847                     | 2,54,100                |
| Ripersia oryzae (Mealy bug).             | Spraying Parathion 20 Ec. at 1 oz. in 12½ gallons.         | 14,742          | 10                         | 564                     | 1,69,200                |
| Nymphula depunctalis Case worm.          | Dusting 10 per cent BHC.                                   | 3,554.55        | 20                         | 132                     | 39,600                  |
| Hispa armigera (Rice hispa).             | Do. ..                                                     | 1,129           | 20                         | 41                      | 12,300                  |
| Grass hopper ..                          | Do. ..                                                     | 5,791           | 20                         | 192                     | 87,600                  |
| Nilaparvata Lugens (Fulgorids).          | Do. ..                                                     | 4,454           | 20                         | 165                     | 49,500                  |
| Scotinophora lurida (Blackbug).          | Do. ..                                                     | 431             | 20                         | 16                      | 4,800                   |
| Cnaphalo medinalis crocis (Leaf roller). | Do. ..                                                     | 835             | 20                         | 31                      | 9,300                   |
| Paranara mathias (Paddy skipper).        | Do. ..                                                     | 612             | 20                         | 23                      | 6,900                   |
| Pachydiplosis oryzae (gall fly).         | Do. ..                                                     | 8,822           | 20                         | 327                     | 98,100                  |
| Spodoptera mauritia (Army worm).         | Spraying DDT ..                                            | 531             | 20                         | 20                      | 6,000                   |
| Termites .. ..                           | Dusting 10 per cent BHC.                                   | 10              | 10                         | 0.3                     | 90                      |
| Echinocnemus Oryzae (Root weevil).       | Application of 10 per cent BHC.                            | 2               | 10                         | 0.07                    | 21                      |
| Flea beetle Baiting Rats.                | Dusting 10 per cent BHC with Zinc Phosphide.               | 12<br>22,201.50 | 10<br>5                    | 0.4<br>822              | 120<br>2,46,600         |
| Millets—                                 |                                                            |                 |                            |                         |                         |
| Cholam—                                  |                                                            |                 |                            |                         |                         |
| Mites (Taratetra nyohus sp.)             | Dusting Sulphur ..                                         | 6,602           | 20                         | 245                     | 53,900                  |
| Chilo zonellus (Shoot borer).            | Spraying BHC. ..                                           | 366             | 20                         | 14                      | 3,080                   |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (b) FOR SOUTHERN REGION—cont.

| Crop and pest.                      | Control measures adopted.                  | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|-------------------------------------|--------------------------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                                 | (2)                                        | (3)<br>ACS.   | (4)<br>PER CENT.           | (5)                     | (6)<br>RS.              |
| <b>Millet—cont.</b>                 |                                            |               |                            |                         |                         |
| <b>Cholam—cont.</b>                 |                                            |               |                            |                         |                         |
| Grass hopper ..                     | Dusting BHC. ..                            | 63            | 20                         | 2                       | 440                     |
| Flea beetle (Chaetocnema sp.).      | Do. ..                                     | 50            | 20                         | 19                      | 4,180                   |
| Calocoris angustatus (Earhead bug). | Do. ..                                     | 6,417         | 20                         | 238                     | 52,360                  |
| <b>Ragi—</b>                        |                                            |               |                            |                         |                         |
| Grasshopper ..                      | Do. ..                                     | 10.50         | 20                         | 0.3                     | 660                     |
| Flea beetle (Chaetocnema sp.).      | Do. ..                                     | 229           | 20                         | 84                      | 18,480                  |
| Laphygma oxigua (leaf noctuids).    | Spraying DDT. ..                           | 33            | 20                         | 1.2                     | 264                     |
| Heliothrips indicus (Thrips).       | Dusting 10 per cent BHC. ..                | 122           | 20                         | 5                       | 1,100                   |
| Stemborer ..                        | Do. ..                                     | 51            | 20                         |                         | 440                     |
| Tettigoniella (Jassids).            | Do. ..                                     | 663           | 20                         | 25                      | 5,500                   |
| <b>Vegetables—</b>                  |                                            |               |                            |                         |                         |
| <b>Brinjal—</b>                     |                                            |               |                            |                         |                         |
| Epilachna beetles ..                | Dusting calcium arsenate plus lime at 1:4. | 8,100.97      | 20                         | 900                     | 2,52,000                |
| Urentius oethinus (Lace wing bug).  | Spraying Parathion at 1 oz. in 10 gallons. | 1.50          | 20                         | 0.2                     | 56                      |
| Red ants ..                         | Dusting Lindane to the soil.               | 7             | 20                         | 0.8                     | 204                     |
| Leucinodes orbonalis (Shoot borer). | Spraying DDT + Sulphur.                    | 524.35        | 20                         | 58                      | 1,276                   |
| Jassids Leucinodis.                 | Do. ..                                     | 75            | 20                         | 8.3                     | 21,240                  |
| Orborialis (Fruit borer).           | Do. ..                                     | 519.35        | 20                         | 58                      | 16,240                  |
| Mito ..                             | Dusting sulphur ..                         | 50            | 20                         | 5.5                     | 15,400                  |
| Aphids ..                           | Dusting Lindane ..                         | 94.93         | 20                         | 10.5                    | 29,400                  |
| Mealy bug (Phenacoccus insolitus).  | Spraying Parathion at 1 oz. in 10 gallons. | 57            | 20                         | 6.3                     | 1,764                   |
| <b>Tomato—</b>                      |                                            |               |                            |                         |                         |
| Heliothis obsoleta (Fruit borer).   | Spraying DDT ..                            | 152           | 20                         | 17                      | 4,760                   |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

## (b) FOR SOUTHERN REGION—cont.

| Crop and pest.                                 | Control measures adopted.                   | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|------------------------------------------------|---------------------------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                                            | (2)                                         | (3)<br>ACS.   | (4)<br>PER CENT.           | (5)                     | (6)<br>RS.              |
| <b>Vegetables—cont.</b>                        |                                             |               |                            |                         |                         |
| <b>Cucurbits—</b>                              |                                             |               |                            |                         |                         |
| Aulocophora beetles ..                         | Dusting Lindane ..                          | 597           | 20                         | 66                      | 18,480                  |
| Aphids ..                                      | Do. ..                                      | 2             | 20                         | 0.2                     | 56                      |
| Lablab Aphids ..                               | Do. ..                                      | 35            | 20                         | 3                       | 840                     |
| <b>Tapioca—</b>                                |                                             |               |                            |                         |                         |
| Rats ..                                        | Baiting with Zinc Phosphide.                | 152           | 5                          | 4.2                     | 1,176                   |
| <b>Onion—</b>                                  |                                             |               |                            |                         |                         |
| Thrips tabuli (Thrips).                        | Spraying Lindane ..                         | 6,750         | 20                         | 790                     | 1,80,120                |
| <b>Cabbage—</b>                                |                                             |               |                            |                         |                         |
| Aphids ..                                      | Dusting Lindane ..                          | 15            | 20                         | 1.7                     | 476                     |
| Cut worm ..                                    | Dusting DDT. ..                             | 2,332         | 20                         | 259                     | 72,520                  |
| <b>Potato—</b>                                 |                                             |               |                            |                         |                         |
| Cut worm ..                                    | Dusting 5 per cent DDT.                     | 965           | 20                         | 241                     | 57,480                  |
| <b>Agathi—</b>                                 |                                             |               |                            |                         |                         |
| Weevil ..                                      | Spraying DDT. ..                            | 28            | 20                         | ..                      | ..                      |
| Semilooper ..                                  | Spraying Endrin ..                          | 259           | 20                         | ..                      | ..                      |
| <b>Condiments—</b>                             |                                             |               |                            |                         |                         |
| Chillies ..                                    | Spraying BHC. ..                            | 24,778.02     | 20                         | ..                      | 24,77,802               |
| <b>Scirto thrips dorsalis (Thrips).</b>        |                                             |               |                            |                         |                         |
| Jassids ..                                     | Dusting DDT. ..                             | 1,055         | 20                         | ..                      | 1,05,500                |
| Heliothis obsoleta (Fruit borer).              | Spraying DDT. ..                            | 582.96        | 20                         | ..                      | 58,296                  |
| Mealy bugs ..                                  | Spray Parathion ..                          | 275           | 20                         | ..                      | 27,500                  |
| Mites ..                                       | Spraying parathion.                         | 30            | 20                         | ..                      | 3,000                   |
| <b>Oilseeds—</b>                               |                                             |               |                            |                         |                         |
| Groundnut Surulpoocy (Stomopteryx nerteria).   | Dusting DDT 5 per cent.                     | 4,646         | 20                         | ..                      | 23,230                  |
| Ansacta albistriga (Red Hairy Caterpillar).    | Spraying Parathion.                         | 15,794        | 20                         | ..                      | 7,89,700                |
| Aphids ..                                      | Dusting BHC. ..                             | 657           | 20                         | ..                      | 32,850                  |
| <b>Coconut—</b>                                |                                             |               |                            |                         |                         |
| Rhynchophorus ferrugineus (Red Palm weevil).   | Application of 1 per cent purvone E.        | 10,452        | 20                         | ..                      | 21,804                  |
| Nephantis Sorinopa (Black headed caterpillar). | Either spraying DDT or releasing parasites. | 24,476        | 20                         | ..                      | 48,952                  |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

(b) FOR SOUTHERN REGION—cont.

| Crop and Pest.                             | Control measures adopted.                                   | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|--------------------------------------------|-------------------------------------------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                                        | (2)                                                         | (3)           | (4)                        | (5)                     | (6)                     |
|                                            |                                                             | ACS.          | PER CENT.                  |                         | RS.                     |
| <b>Oilseeds—cont.</b>                      |                                                             |               |                            |                         |                         |
| <b>Coconut—cont.</b>                       |                                                             |               |                            |                         |                         |
| Oryctes rhinoceros (Rhinoceros beetle).    | Extraction of the beetles and applying BHC mixed with sand. | 62,707        | 20                         | ..                      | 1,25,414                |
| White ants ..                              | Application of 10 per cent BHC.                             | 112           | 20                         | ..                      | 224                     |
| Rattus Rattus (Rat)                        | Baiting with Zinc Phosphide.                                | 203           | 20                         | ..                      | 406                     |
| <b>Gingelly—</b>                           |                                                             |               |                            |                         |                         |
| Antigastra. Catalaunabs (Pest caterpillar) | Spraying DDT. ..                                            | 17            | 20                         | ..                      | 850                     |
| <b>Spices—</b>                             |                                                             |               |                            |                         |                         |
| Cardomom Thrips ..                         | Spraying BHC ..                                             | 3,045         | 20                         | ..                      | ..                      |
| <b>Drugs and narcotics—</b>                |                                                             |               |                            |                         |                         |
| Tobacco Shoot borer..                      | Spraying Parathion                                          | 150           | 20                         | ..                      | 7,500                   |
| Aphids (Myzus persicae)                    | Do.                                                         | 1,290         | 20                         | ..                      | 64,500                  |
| Cutworms. (Prodenia litura)                | Do.                                                         | 361           | 20                         | ..                      | 18,050                  |
| <b>Betelvine—</b>                          |                                                             |               |                            |                         |                         |
| Scales .. ..                               | Spraying Pyrocolloid                                        | 3             | 20                         | ..                      | 300                     |
| Mites .. ..                                | Dusting sulphur ..                                          | 78            | 20                         | ..                      | 7,800                   |
| <b>Fibre—</b>                              |                                                             |               |                            |                         |                         |
| Cotton. Bollworm ..                        | Spraying Parathion                                          | 6,102         | 20                         | ..                      | 6,10,200                |
| Jassids. (Empoasca devastans)              | Do.                                                         | 9,344         | 20                         | ..                      | 9,34,400                |
| Cotton Jassids and Bollworms.              | Do.                                                         | 2,576         | 20                         | ..                      | 2,57,600                |
| Leaf roller Sylepta derogata.              | Do.                                                         | 6,438         | 20                         | ..                      | 6,43,800                |
| <b>Thrips—</b>                             |                                                             |               |                            |                         |                         |
| Thrips tabaci.. ..                         | Do.                                                         | 1,973         | 20                         | ..                      | 1,97,300                |
| Plant Lice (Aphis gossypii)                | Do.                                                         | 9,376         | 20                         | ..                      | 9,37,600                |
| Mealy bug .. ..                            | Do.                                                         | 25            | 20                         | ..                      | 2,500                   |
| Pemphres affinis (Stem weevil)             | Do.                                                         | 10            | 20                         | ..                      | 1,000                   |
| <b>Sugars—</b>                             |                                                             |               |                            |                         |                         |
| <b>Sugarcane—</b>                          |                                                             |               |                            |                         |                         |
| Termites .. ..                             | Application of BHC.                                         | 3,645         | 10                         | 9,935                   | 2,98,050                |
| Early shoot borer ..                       | Spraying DDT ..                                             | 3,688         | 20                         | 11,064                  | 3,31,920                |

## APPENDIX No 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

(b) FOR SOUTHERN REGION—cont.

| Crop and Pest.                      | Control measures adopted.                          | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|-------------------------------------|----------------------------------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                                 | (2)                                                | (3)           | (4)                        | (5)                     | (6)                     |
|                                     |                                                    | ACS.          | PER CENT.                  |                         | RS.                     |
| <b>Sugars—cont.</b>                 |                                                    |               |                            |                         |                         |
| <b>Sugarcane—cont.</b>              |                                                    |               |                            |                         |                         |
| Rodents .. ..                       | Baiting with Zinc Phosphide.                       | 132           | 5                          | 396                     | 9,880                   |
| Top shoot borer ..                  | Adoption of Mechanical methods.                    | 29            | 20                         | 87                      | 2,610                   |
| Scales .. ..                        | Spraying Parathion                                 | 2             | 20                         | 6                       | 180                     |
| Pyrilla .. ..                       | Do.                                                | 170           | 20                         | 510                     | 15,300                  |
| <b>Fruit trees—</b>                 |                                                    |               |                            |                         |                         |
| Mango .. ..                         | Spraying DDT ..                                    | 372           | 20                         | ..                      | 74                      |
| Ashweevil                           |                                                    |               |                            |                         |                         |
| Leaf eating caterpillar             | Spraying DDT ..                                    | 1,352         | 20                         | ..                      | 2,704                   |
| Hopper .. ..                        | Do.                                                | 26,449        | 20                         | ..                      | 52,898                  |
| Mealy bug .. ..                     | Spraying Parathion                                 | 742           | 20                         | ..                      | 14,845                  |
| Red ants .. ..                      | Spraying BHC ..                                    | 5             | 20                         | ..                      | 10                      |
| Leafroller (Aporia tranque baricus) | Clipping of the leaves and Spraying DDT.           | 120           | 20                         | ..                      | 240                     |
| Stemborer. (Batocera rubus)         | Syrinkling Petrol and closing the hole with clay.  | 100           | 20                         | ..                      | 200                     |
| <b>Citrus—</b>                      |                                                    |               |                            |                         |                         |
| Papilio demoleus (Citrus butterfly) | Spraying BHC ..                                    | 13,884        | 20                         | ..                      | 27,768                  |
| Citrus mite .. ..                   | Spraying sulphur ..                                | 1,547         | 20                         | ..                      | 3,094                   |
| Mealy bug .. ..                     | Spraying Parathion                                 | 272           | 20                         | ..                      | 544                     |
| Aphids.. ..                         | Spraying BHC ..                                    | 3,395         | 20                         | ..                      | 6,770                   |
| Bark borer .. ..                    | Sprinkling Petrol and closing the holes with clay. | 71            | 20                         | ..                      | 142                     |
| Leaf miner (Phyllocnistis citrella) | Spraying BHC ..                                    | 3,000         | 20                         | ..                      | 6,000                   |
| <b>Pomegranate—</b>                 |                                                    |               |                            |                         |                         |
| Mealy bug .. ..                     | Spraying Parathion                                 | 120           | 20                         | ..                      | 240                     |
| <b>Apple—</b>                       |                                                    |               |                            |                         |                         |
| Scales .. ..                        | Do.                                                | 180           | 20                         | ..                      | 360                     |
| <b>Guava—</b>                       |                                                    |               |                            |                         |                         |
| Scales .. ..                        | Do.                                                | 450           | 20                         | ..                      | 900                     |
| <b>Plum—</b>                        |                                                    |               |                            |                         |                         |
| Scales .. ..                        | Do.                                                | 120           | 20                         | ..                      | 240                     |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

(b) FOR SOUTHERN REGION—cont.

| Crop and Pest.                        | Control measures adopted.                      | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|---------------------------------------|------------------------------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                                   | (2)                                            | (3)           | (4)                        | (5)                     | (6)                     |
|                                       |                                                | ACS.          | PER CENT.                  |                         | RS.                     |
| Fruit trees—cont.                     |                                                |               |                            |                         |                         |
| Grapevine—                            |                                                |               |                            |                         |                         |
| Scalodonta Strigicollis (Flea beetle) | Spraying DDT.                                  | 2,399         | 20                         | ..                      | 2,39,900                |
| Cashew—                               |                                                |               |                            |                         |                         |
| Leaf roller .. ..                     | Removing the affected leaves and spraying DDT. | 2,560 NOS.    | 20                         | ..                      | 5,120                   |
| Capsid .. ..                          | Spraying BHC ..                                | 6,620 NOS.    | 20                         | ..                      | 13,240                  |
| Mealy bug .. ..                       | Spraying Parathian                             | 15 NOS.       | 20                         | ..                      | 30                      |
| Banana—                               |                                                |               |                            |                         |                         |
| Prodenia .. ..                        | Spraying DDT ..                                | 80 ACRES.     | 20                         | ..                      | 400                     |
| Jack—                                 |                                                |               |                            |                         |                         |
| Fruit borer .. ..                     | Removing the affected fruits and spraying DDT. | 15 NOS.       | 20                         | ..                      | 30                      |
| Beverages—                            |                                                |               |                            |                         |                         |
| Coffee—                               |                                                |               |                            |                         |                         |
| Green bug (Loca-inum Viride)          | Spraying Parathion                             | 8,000 ACRES.  | 20                         | ..                      | ..                      |
| Stemborer (Xylo-trechus quadripes)    | Spraying Parathian                             | 920 ACRES.    | 20                         | ..                      | ..                      |
| Tea—                                  |                                                |               |                            |                         |                         |
| Mite .. ..                            | Spraying of Aramito                            | 1,600 ACRES.  | 20                         | ..                      | ..                      |
| Miscellaneous crops—                  |                                                |               |                            |                         |                         |
| Rose—                                 |                                                |               |                            |                         |                         |
| Mealy bug .. ..                       | Spraying Parathion                             | 2,500 NOS.    | 20                         | ..                      | ..                      |
| Jasmine—                              |                                                |               |                            |                         |                         |
| Leaf caterpillar ..                   | Spraying BHC ..                                | 15 ACRES.     | ..                         | ..                      | ..                      |
| Thrips .. ..                          | Do.                                            | 54 ACRES.     | ..                         | ..                      | ..                      |

## APPENDIX No. 24—cont.

Statement showing the pests of crops tackled and savings effected during the year 1959-60—cont.

(b) FOR SOUTHERN REGION—cont.

| Crop and Pest.            | Control measures adopted. | Area tackled. | Percentage of infestation. | Quantity saved in tons. | Money values in rupees. |
|---------------------------|---------------------------|---------------|----------------------------|-------------------------|-------------------------|
| (1)                       | (2)                       | (3)           | (4)                        | (5)                     | (6)                     |
|                           |                           | ACS.          | PER CENT.                  |                         | RS.                     |
| Miscellaneous crops—cont. |                           |               |                            |                         |                         |
| Agathi—                   |                           |               |                            |                         |                         |
| Weevil. .. .              | Spraying DDT ..           | 28            | 20                         | ..                      | ..                      |
| Prodenia .. ..            | Do. ..                    | 259           | 20                         | ..                      | ..                      |
| Semilooper .. ..          | Spraying Endrin ..        | 120           | 20                         | ..                      | ..                      |

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

(a) FOR NORTHERN REGION.

| Serial number and crop. | Disease.                 | Area tackled Ac/No. | Estimated gain in tons/ rupees. | Districts.                                                                        |
|-------------------------|--------------------------|---------------------|---------------------------------|-----------------------------------------------------------------------------------|
| (1)                     | (2)                      | (3)                 | (4)                             | (5)                                                                               |
| 1 Paddy ..              | (a) Blast ..             | 2,384.00            |                                 | Chingleput.<br>South Arcot.<br>North Arcot.<br>Salem.<br>Coimbatore.              |
|                         |                          | 2,136.00            |                                 |                                                                                   |
|                         |                          | 984.00              |                                 |                                                                                   |
|                         |                          | 2,304.00            |                                 |                                                                                   |
|                         |                          | 1,439.50            |                                 |                                                                                   |
|                         | Total ..                 | 9,247.50            | TONS.<br>330.20                 |                                                                                   |
|                         | (b) Helminthosporium.    | 3,327.00            |                                 | Chingleput.<br>South Arcot.<br>North Arcot.<br>Salem.<br>Coimbatore.              |
|                         |                          | 2,436.00            |                                 |                                                                                   |
|                         |                          | 946.00              |                                 |                                                                                   |
|                         |                          | 284.00              |                                 |                                                                                   |
|                         |                          | 531.50              |                                 |                                                                                   |
|                         | Total ..                 | 7,524.50            | 268.73                          |                                                                                   |
|                         | (c) Seed-borne diseases. | 3,105.00            |                                 | Chingleput.<br>South Arcot.<br>North Arcot.<br>Salem.<br>Coimbatore.<br>Nilgiris. |
|                         |                          | 8,321.00            |                                 |                                                                                   |
|                         |                          | 3,059.00            |                                 |                                                                                   |
|                         |                          | 3,559.00            |                                 |                                                                                   |
|                         |                          | 1,653.00            |                                 |                                                                                   |
|                         | Total ..                 | 19,854.00           | 709.10                          |                                                                                   |



## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Serial number and crop. | Disease.                | Area tackled Ac/No. | Estimated gain in tons/ rupees. | Districts.   |
|-------------------------|-------------------------|---------------------|---------------------------------|--------------|
| (1)                     | (2)                     | (3)                 | (4)                             | (5)          |
|                         |                         |                     | RS.                             |              |
| 1 Paddy—cont.           | (d) Stem rot ..         | 462.00              | 16.50                           | South Arcot. |
|                         | (e) Algae ..            | 329.00              | 11.75                           | North Arcot. |
| 2 Cholani ..            | Smut.                   | 108.00              |                                 | Chingleput.  |
|                         |                         | 245.00              |                                 | North Arcot. |
|                         |                         | 2,504.00            |                                 | Salem.       |
|                         |                         | 437.00              |                                 | Coimbatore.  |
|                         | Total ..                | 3,294.00            | 117.64                          |              |
| 3 Ragi ..               | Blast ..                | 791.75              |                                 | Chingleput.  |
|                         |                         | 649.00              |                                 | South Arcot. |
|                         |                         | 449.00              |                                 | North Arcot. |
|                         |                         | 280.00              |                                 | Salem.       |
|                         |                         | 839.00              |                                 | Coimbatore.  |
|                         | Total ..                | 3,508.75            | 125.31                          |              |
| 4 Cumbu ..              | Green ear ..            | 184.00              | 6.57                            | Salem.       |
| 5 Chillies ..           | Fruit rot and Die back. | 1,165.00            |                                 | Chingleput.  |
|                         |                         | 439.00              |                                 | South Arcot. |
|                         |                         | 231.00              |                                 | Salem.       |
|                         |                         | 2,086.00            |                                 | Coimbatore.  |
|                         |                         | 60.00               |                                 | North Arcot. |
|                         | Total ..                | 3,981.00            | 159.20                          |              |
|                         | Leaf spot ..            | 408.00              |                                 | Salem.       |
|                         |                         | 105.00              |                                 | Coimbatore.  |
|                         | Total ..                | 513.00              | 76.950                          |              |
| 6 Turmeric ..           | Leaf spot ..            | 246.00              |                                 | Salem.       |
|                         |                         | 214.00              |                                 | Coimbatore.  |
|                         |                         | 40.00               |                                 | South Arcot. |
|                         | Total ..                | 500.00              | 75.000                          |              |
| 7 Betelvine ..          | Wilt ..                 | 8.00                | 2,000                           | Salem.       |
| 8 Sugarcane ..          | (a) Smut ..             | 632.00              |                                 | Salem.       |
|                         |                         | 874.00              |                                 | North Arcot. |
|                         |                         | 157.00              |                                 | Coimbatore.  |
|                         |                         | 58.00               |                                 | South Arcot. |
|                         |                         | 4.00                |                                 | Chingleput.  |
|                         | Total ..                | 1,723.00            | 1,37,840                        |              |

## APPENDIX 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (a) FOR NORTHERN REGION—cont.

| Serial number and crops. | Disease.                       | Area tackled. Ac/No. | Estimated gain in tons/ rupees. | Districts.   |
|--------------------------|--------------------------------|----------------------|---------------------------------|--------------|
| (1)                      | (2)                            | (3)                  | (4)                             | (5)          |
|                          |                                |                      | RS.                             |              |
| 8 Sugarcane—cont.        | (b) Chlorosis ..               | 8.00                 | 640                             | Coimbatore.  |
|                          | (c) Sett rot ..                | 419.00               |                                 | South Arcot. |
|                          |                                | 1,286.00             |                                 | North Arcot. |
|                          |                                | 1,160.00             |                                 | Chingleput.  |
|                          | Total ..                       | 2,865.00             | 2,29,200                        |              |
|                          | Pretreating setts with aretan. | 3,680.00             | 2,94,400                        | South Arcot. |
| 9 Cotton ..              | Black arm ..                   | 168.00               |                                 | North Arcot. |
|                          |                                | 2,843.00             |                                 | Coimbatore.  |
|                          |                                | 839.00               |                                 | Salem.       |
|                          | Total ..                       | 3,850.00             | 1,92,500                        |              |
| 10 Groundnut ..          | Tikka leafspot.                | 1,013.50             |                                 | Chingleput.  |
|                          |                                | 72.00                |                                 | North Arcot. |
|                          |                                | 546.00               |                                 | South Arcot. |
|                          |                                | 233.00               |                                 | Coimbatore.  |
|                          |                                | 32.00                |                                 | Salem.       |
|                          | Total ..                       | 1,896.00             | 3,79,300                        |              |
|                          | (b) Root rot ..                | 8.00                 | 1,600                           | North Arcot. |
|                          | (c) Wilt ..                    | 28.00                | 5,600                           | North Arcot. |
| 11 Arecanut ..           | Wilt ..                        | 4,559.00             |                                 | Salem.       |
|                          |                                | 120.00               |                                 | Coimbatore.  |
|                          | Total ..                       | 4,679 No.            | 9,358                           |              |
| 12 Coffee ..             | Rust ..                        | 560.00               |                                 | Nilgiris.    |
|                          |                                | 148.00               |                                 | Salem.       |
|                          | Total ..                       | 708.00               | 1,41,600                        |              |
| 13 Tea ..                | Blister blight ..              | 770.00               | 1,54,000                        | Nilgiris.    |
| 14 Potato ..             | (a) Early blight.              | 892.00               | 89,200                          | Nilgiris.    |
|                          | (b) Virus ..                   | 668.50               | 66,850                          | Nilgiris.    |
| 15 Cabbage ..            | (a) Club root ..               | 96.50                | TONS. 96.5                      | Nilgiris.    |
|                          | (b) Leaf spot ..               | 60.00                |                                 | North Arcot. |
|                          |                                | 9.00                 |                                 | Salem.       |
|                          | Total ..                       | 69.00                | TONS. 6.90                      |              |

## APPENDIX 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

(a) FOR NORTHERN REGION—cont.

| Serial number and crop. | Disease.                 | Area tackled Ac.No.             | Estimated gain in tons/ rupees. | Districts.                                                 |
|-------------------------|--------------------------|---------------------------------|---------------------------------|------------------------------------------------------------|
| (1)                     | (2)                      | (3)                             | (4)                             | (5)                                                        |
| 16 Onion ..             | Blight. ..               | 135.00<br>4.00<br>1.60          |                                 | Salem.<br>South Arcot.<br>Coimbatore.                      |
|                         | Total ..                 | 140.50                          | TONS.<br>14.50                  |                                                            |
| 17 Tomato ..            | Leaf spot ..             | 16.00<br>5.00<br>8.00<br>19.00  |                                 | Salem.<br>South Arcot.<br>North Arcot.<br>Chingleput.      |
|                         | Total ..                 | 48.00                           | TONS.<br>4.80                   |                                                            |
| 18 Grapes ..            | Downy Mildew.            | 804.00<br>303.00                |                                 | Salem.<br>Coimbatore.                                      |
|                         | Total ..                 | 1,107.00                        | RS.<br>11,07,000                |                                                            |
|                         | (b) Powdery mildew.      | 2.00                            | 2,000                           | Salem.                                                     |
| 19 Banana ..            | (a) Wilt ..              | 35.00<br>4.00                   |                                 | Salem-<br>Chingleput.                                      |
|                         | Total ..                 | 39.00                           | TONS.<br>39.00                  |                                                            |
|                         | (b) Leaf spot..          | 93.00<br>100.00<br>2.00<br>2.00 |                                 | North Arcot.<br>Chingleput.<br>Coimbatore.<br>South Arcot. |
|                         | Total ..                 | 197.00                          | 197.00                          |                                                            |
| 20 Citrus ..            | (a) Canker and die back  | 7,198<br>630<br>2,708<br>1,160  |                                 | North Arcot.<br>South Arcot.<br>Chingleput.<br>Salem.      |
|                         | Total ..                 | 11,694 Nos.                     | RS.<br>23,388                   |                                                            |
|                         | (b) Deficiency diseases. | 356<br>320<br>136<br>50         |                                 | South Arcot.<br>North Arcot.<br>Salem.<br>Nilgiris.        |
|                         | Total ..                 | 856 Nos.                        | RS.<br>1,712                    |                                                            |

## APPENDIX No. 24—con'.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

(a) FOR NORTHERN REGION—cont.

| Serial number and crop. | Disease.            | Area tackled Ac./No.              | Estimated gain in tons/ rupees. | Districts.                                            |
|-------------------------|---------------------|-----------------------------------|---------------------------------|-------------------------------------------------------|
| (1)                     | (2)                 | (3)                               | (4)                             | (5)                                                   |
| 20 Citrus—cont.         |                     |                                   |                                 |                                                       |
|                         | (c) Decline ..      | 250<br>160<br>85                  | RS.<br>990                      | Nilgiris.<br>North Arcot.<br>Salem.                   |
|                         | Total ..            | 495 Nos.                          |                                 |                                                       |
|                         | (d) Gummosis        | Nos.<br>1,328                     | RS.<br>2,656                    | Salem.                                                |
|                         | (e) Foliocellosis.  | 426                               | RS.<br>852                      | Salem.                                                |
| 21 Coconut ..           | Stem bleed-<br>ing. | NOS.<br>1,376<br>550<br>850<br>10 | RS.<br>5,572                    | North Arcot.<br>Salem.<br>South Arcot.<br>Coimbatore. |
|                         | Total ..            | 2,786 Nos.                        |                                 |                                                       |
| 22 Tobacco ..           | Powdery mildew.     | 50<br>Ac.                         | 5,000                           | Coimbatore.                                           |
| 23 Peas ..              | Powdery mildew.     | 107.50                            | TONS.<br>10.75                  | Nilgiris.                                             |
| 24 Brinjal ..           | Virus ..            | 28.00<br>Nos.                     | 2.8                             | North Arcot.                                          |
| 25 Acid Lime ..         | Canker..            | 300                               | RS.<br>600                      | North Arcot.                                          |
| 26 Mango ..             | Powdery mildew.     | 1,280<br>49<br>350                |                                 | North Arcot.<br>Coimbatore.<br>South Arcot.           |
|                         | Total ..            | 1,679 Nos.                        |                                 |                                                       |
| 27 Miscellaneous        | Crops ..            | 428.00<br>15.00                   |                                 | Chingleput.<br>Nilgiris.                              |
|                         | Total ..            | 443.00                            | RS.<br>88,600                   |                                                       |
| 28 Miscellaneous        | Trees ..            | 404<br>450<br>100<br>100          | RS.<br>2,108                    | Chingleput.<br>North Arcot.<br>Coimbatore.<br>Salem.  |
|                         | Total ..            | 1,054 Nos.                        |                                 |                                                       |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) SOUTHERN REGION.

| Serial number and crop. | Disease.               | Area tackled Ac./No.                                                                                                                                       | Estimated gain in tons/rupees. | Districts.                                                                                                                                                                                                       |
|-------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                     | (2)                    | (3)                                                                                                                                                        | (4)                            | (5)                                                                                                                                                                                                              |
| 1 Paddy ..              | (a) Blast ..           | 901.00<br>2,723.00<br>3,208.00<br>206.00                                                                                                                   |                                | Nagercoil.<br>Dindigul.<br>Madurai.<br>Sivaganga.                                                                                                                                                                |
| Food crops—             |                        |                                                                                                                                                            |                                |                                                                                                                                                                                                                  |
| 1 Paddy ..              | 1 Blast ..             | 488.00<br>422.75<br>30.00<br>480.00<br>1,452.00<br>375.00<br>1,154.00<br>647.50<br>100.00                                                                  | TONS.<br>437.42                | Sattur.<br>Mayuram.<br>Kumbakonam.<br>Pattukottai.<br>Palayamkottai.<br>Sankarankoil.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South).<br>Thanjavur.                                                      |
|                         | Total ..               | 12,247.25                                                                                                                                                  |                                |                                                                                                                                                                                                                  |
|                         | 2 Helmintho-sporiose.  | 2,128.00<br>120.00<br>376.00<br>2,870.00<br>882.00<br>248.00<br>350.00<br>532.00<br>803.00<br>2,554.50<br>310.50                                           | TONS.<br>399.07                | Nagercoil.<br>Dindigul.<br>Madurai.<br>Kumbakonam.<br>Mayuram.<br>Pattukottai.<br>Thanjavur.<br>Palayamkottai.<br>Sankarankoil.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South).                          |
|                         | Total ..               | 11,174.00                                                                                                                                                  |                                |                                                                                                                                                                                                                  |
|                         | 3 Seed borne diseases. | 1,275.00<br>8,560.00<br>2,988.00<br>7,205.00<br>1,358.00<br>11,850.00<br>6,041.00<br>9,390.00<br>10,126.13<br>1,447.00<br>5,750.00<br>6,152.00<br>4,682.00 | TONS.<br>2,743.72              | Nagercoil.<br>Dindigul.<br>Madurai.<br>Sattur.<br>Sivaganga.<br>Kumbakonam.<br>Mayuram.<br>Pattukottai.<br>Thanjavur.<br>Palayamkottai.<br>Sankarankoil.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South). |
|                         | Total ..               | 76,824.13                                                                                                                                                  |                                |                                                                                                                                                                                                                  |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) SOUTHERN REGION—cont.

| Serial number and crop. | Disease.                      | Area tackled Ac./No.                                                 | Estimated gain in tons/rupees. | Districts.                                                                                                                               |
|-------------------------|-------------------------------|----------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                     | (2)                           | (3)                                                                  | (4)                            | (5)                                                                                                                                      |
| Food crops—cont.        |                               |                                                                      |                                |                                                                                                                                          |
| 1 Paddy—cont.           |                               |                                                                      |                                |                                                                                                                                          |
|                         | 4 Pythrum rot                 | 105.00<br>75.00                                                      | TONS.<br>6.43                  | Thanjavur.<br>Kumbakonam.                                                                                                                |
|                         | Total ..                      | 180.00                                                               |                                |                                                                                                                                          |
|                         | 5 Algal growth                | 263.00<br>120.00<br>21.00<br>102.00                                  | TONS.<br>18.07                 | Thanjavur.<br>Kumbakonam.<br>Madurai.<br>Tiruchirappalli (North).                                                                        |
|                         | Total ..                      | 506.00                                                               |                                |                                                                                                                                          |
|                         | Total for Paddy..             | 1,00,931.38                                                          | TONS.<br>3,604.71              |                                                                                                                                          |
|                         | 2 Ragi ..                     | 35.00<br>739.00<br>95.00<br>14.00<br>1.00<br>80.00<br>12.00<br>26.00 | TONS.<br>71.57                 | Dindigul.<br>Madurai.<br>Sattur.<br>Sivaganga.<br>Pattukottai.<br>Palayamkottai.<br>Tiruchirappalli (South).<br>Tiruchirappalli (North). |
|                         | Total for Ragi ..             | 1,002.00                                                             |                                |                                                                                                                                          |
|                         | 3 Cholam ..                   | 4,291.00<br>172.00<br>1,666.00<br>524.00<br>15.00                    | 238.14                         | Dindigul.<br>Madurai.<br>Sattur.<br>Palayamkottai.<br>Tiruchirappalli (South).                                                           |
|                         | Total for Cholam ..           | 6,688.00                                                             |                                |                                                                                                                                          |
|                         | Grand total for food crops .. | 1,08,601.38                                                          | 3,914.42 Tons.                 |                                                                                                                                          |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) SOUTHERN REGION—cont.

| Serial number and crop. | Diseases.                   | Area tackled Ac./No.     | Estimated gain in tons/rupees. | Districts.                              |
|-------------------------|-----------------------------|--------------------------|--------------------------------|-----------------------------------------|
| (1)                     | (2)                         | (3)                      | (4)                            | (5)                                     |
| Other crops—            |                             |                          |                                |                                         |
| 1 Redgram ..            | Wilt .. ..                  | 2.00                     |                                | Kumbakonam.                             |
| 2 Vegetables—           |                             |                          |                                |                                         |
| (a) Brinjal ..          | 1 Wilt .. ..                | 10.00<br>11.00<br>55.00  |                                | Kumbakonam.<br>Thanjavur.<br>Nagercoil. |
|                         | Total ..                    | 76.00                    |                                |                                         |
|                         | 2 Little leaf ..            | 4.00<br>8.00             |                                | Sivaganga.<br>Kumbakonam.               |
|                         | Total ..                    | 12.00                    |                                |                                         |
|                         | 3 Fruit-rot ..              | 6.00                     |                                | Kumbakonam.                             |
|                         | 4 Die-back ..               | 26.00                    |                                | Nagercoil.                              |
| (b) Cabbage ..          | Leaf diseases ..            | 1,051.00<br>30.00        |                                | Madurai.<br>Dindigul.                   |
|                         | Total ..                    | 1,081.00                 |                                |                                         |
| (c) Onion ..            | Leaf blight ..              | 135.00<br>682.00         |                                | Madurai.<br>Dindigul.                   |
|                         | Total ..                    | 817.00                   |                                |                                         |
| (d) Tomato ..           | Leaf diseases ..            | 410.00<br>136.00<br>5.00 |                                | Dindigul.<br>Madurai.<br>Sivaganga.     |
|                         | Total ..                    | 551.00                   |                                |                                         |
|                         | Wilt .. ..                  | 5.00                     |                                | Kumbakonam.                             |
| (e) Bendi ..            | 1 Vein clearing.            | 1.00                     |                                | Kumbakonam.                             |
|                         | 2 Leaf spot ..              | 1.50                     |                                | Tiruchirappalli (South).                |
| (f) Yam ..              | Alternaria ..               | 2.00                     |                                | Kumbakonam.                             |
| (g) Vegetables.         | Wilt .. ..                  | 9.00<br>10.00            |                                | Nagercoil.<br>Tiruchirappalli (North).  |
|                         | Total ..                    | 19.00                    |                                |                                         |
|                         | Grand total for vegetables. | 2,597.50                 |                                |                                         |

## APPENDIX 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) SOUTHERN REGION—cont.

| Serial number and crop. | Disease.                | Area tackled Ac./No.                                                                                                          | Estimated gain in tons/rupees. | District.                                                                                                                                                                                                         |
|-------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                     | (2)                     | (3)                                                                                                                           | (4)                            | (5)                                                                                                                                                                                                               |
| Other crops—cont.       |                         |                                                                                                                               |                                |                                                                                                                                                                                                                   |
| 3 Chillies ..           | Fruit-rot and die-back. | 262.25<br>2,250.00<br>4,239.32<br>6,976.00<br>1,588.78<br>281.00<br>143.00<br>81.00<br>145.00<br>883.00<br>2,305.00<br>525.00 |                                | Nagercoil.<br>Dindigul.<br>Madurai.<br>Sattur.<br>Sivaganga.<br>Kumbakonam.<br>Mayuram.<br>Pattukkottai.<br>Thanjavur.<br>Palayamkottai.<br>Sankarankoil.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South). |
|                         | Total ..                | 19,748.60                                                                                                                     |                                |                                                                                                                                                                                                                   |
|                         | Wilt .. ..              | 10.00<br>229.00<br>5.00                                                                                                       |                                | Nagercoil.<br>Thanjavur.<br>Kumbakonam.                                                                                                                                                                           |
|                         | Total ..                | 334.00                                                                                                                        |                                |                                                                                                                                                                                                                   |
|                         | Powdery mildew.         | 95.00                                                                                                                         |                                | Dindigul.                                                                                                                                                                                                         |
|                         | Total for chillies      | 20,177.60                                                                                                                     |                                |                                                                                                                                                                                                                   |
| 4 Sugarcane ..          | 1 Smut ..               | 197.00<br>2,165.00<br>12.00<br>3.00<br>694.00<br>288.00                                                                       |                                | Dindigul.<br>Sattur.<br>Sivaganga.<br>Mayuram.<br>Thanjavur.<br>Tiruchirappalli (North).                                                                                                                          |
|                         | Total ..                | 3,359.00                                                                                                                      |                                |                                                                                                                                                                                                                   |
|                         | 2 Sett-rot ..           | 380.00<br>130.00<br>5.00<br>38.00<br>0.25<br>800.00<br>1.50<br>175.00                                                         |                                | Dindigul.<br>Sattur.<br>Sivaganga.<br>Kumbakonam.<br>Mayuram.<br>Thanjavur.<br>Palayamkottai.<br>Tiruchirappalli (South).                                                                                         |
|                         | Total ..                | 1,530.25                                                                                                                      |                                |                                                                                                                                                                                                                   |
|                         | Total for sugarcane.    | 4,889.25                                                                                                                      |                                |                                                                                                                                                                                                                   |

## APPENDIX 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

(b) SOUTHERN REGION—cont.

| Serial number and crop. | Disease.           | Area tackled Ac./No.                                                                         | Estimated gain in tons/rupees. | District.                                                                                                                                  |
|-------------------------|--------------------|----------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| (1)                     | (2)                | (3)                                                                                          | (4)                            | (5)                                                                                                                                        |
| Other crops—cont.       |                    |                                                                                              |                                |                                                                                                                                            |
| 5 Cotton ..             | 1 Black arm ..     | 2,111.00<br>4,548.00<br>3,520.00<br>35.00<br>60.00<br>951.00<br>381.00<br>6,050.00<br>371.00 |                                | Dindigul.<br>Madurai.<br>Sattur.<br>Sivaganga.<br>Mayuram.<br>Pattukkottai.<br>Palayamkottai.<br>Sankarankoil.<br>Tiruchirappalli (North). |
|                         | Total ..           | 18,027.00                                                                                    |                                |                                                                                                                                            |
|                         | 2 Seedling blight. | 50.00<br>7.00                                                                                |                                | Nagercoil.<br>Sivaganga.                                                                                                                   |
|                         | Total ..           | 57.00                                                                                        |                                |                                                                                                                                            |
|                         | 3 Wilt ..          | 185.00                                                                                       |                                | Thanjavur.                                                                                                                                 |
|                         | Total for cotton   | 18,269.00                                                                                    |                                |                                                                                                                                            |
| 6 Turmeric. ..          | Leaf spot ..       | 36.00<br>145.00                                                                              |                                | Kumbakonam.<br>Tiruchirappalli (South).                                                                                                    |
|                         | Total ..           | 181.00                                                                                       |                                |                                                                                                                                            |
| 7 Potato ..             | Early blight ..    | 635.00                                                                                       |                                | Dindigul.                                                                                                                                  |
| 8 Tobacco ..            | 1 Frog eye spot    | 70.00<br>300.00<br>5.00<br>10.00                                                             |                                | Dindigul.<br>Sattur.<br>Mayuram.<br>Palayamkottai.                                                                                         |
|                         | Total ..           | 385.00                                                                                       |                                |                                                                                                                                            |
|                         | 2 Black shank.     | 20.00                                                                                        |                                | Nagercoil.                                                                                                                                 |
|                         | 3 Damping off.     | 4.00                                                                                         |                                | Nagercoil.                                                                                                                                 |
|                         | Total for tobacco. | 409.00                                                                                       |                                |                                                                                                                                            |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont..

(b) SOUTHERN REGION—cont.

| Serial number and crop. | Disease.              | Area tackled Ac./No.                                    | Estimated gain in tons/rupees. | District.                                                                                                          |
|-------------------------|-----------------------|---------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|
| (1)                     | (2)                   | (3)                                                     | (4)                            | (5)                                                                                                                |
| Other crops—cont.       |                       |                                                         |                                |                                                                                                                    |
| 9 Betelvine ..          | 1 Wilt ..             | 41.00<br>39.00<br>40.00<br>3.00                         |                                | Kumbakonam.<br>Thanjavur.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South).                                  |
|                         | Total ..              | 123.00                                                  |                                |                                                                                                                    |
|                         | 2 Mildew ..           | 129.00<br>4.00<br>26.00<br>8.75                         |                                | Madurai.<br>Kumbakonam.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South).                                    |
|                         | Total ..              | 167.75                                                  |                                |                                                                                                                    |
|                         | Total for betel vine. | 290.75                                                  |                                |                                                                                                                    |
| 10 Banana ..            | 1 Wilt ..             | 38.00<br>0.02<br>0.10<br>1.00<br>1.57<br>74.00<br>49.00 |                                | Dindigul.<br>Sattur.<br>Sivaganga.<br>Pattukkottai.<br>Palayamkottai.<br>Sankarankoil.<br>Tiruchirappalli (North). |
|                         | Total ..              | 163.69                                                  |                                |                                                                                                                    |
|                         | 2 Leaf diseases ..    | 2.50                                                    |                                | Sivaganga.                                                                                                         |
|                         | 3 Bunchy top ..       | 103.50                                                  |                                | Nagercoil.                                                                                                         |
|                         | Total for banana      | 275.69                                                  |                                |                                                                                                                    |
| 11 Rose ..              | Leaf spot ..          | 6.00                                                    |                                | Tiruchirappalli (North).                                                                                           |
| 12 Miscellaneous.       | Wilt ..               | 85.00                                                   |                                | Nagercoil.                                                                                                         |
| 13 Ginger ..            | Soft rot ..           | 3.00                                                    |                                | Do.                                                                                                                |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) SOUTHERN REGION—cont.

| Serial number and crop.     | Disease.               | Area tackled Ac./No. | Estimated gain in tons/ rupees. | Districts.               |
|-----------------------------|------------------------|----------------------|---------------------------------|--------------------------|
| (1)                         | (2)                    | (3)                  | (4)                             | (5)                      |
| Oilseeds—                   |                        |                      |                                 |                          |
| 14 Groundnut ..             | 1 Tikka leaf spot.     | 595.00               |                                 | Dindigul.                |
|                             |                        | 68.50                |                                 | Sivaganga.               |
|                             |                        | 164.00               |                                 | Kumbakonam.              |
|                             |                        | 66.00                |                                 | Palayamkottai.           |
|                             |                        | 252.00               |                                 | Sankarankoil.            |
|                             |                        | 189.00               |                                 | Trichirappalli (North).  |
|                             |                        | 6.00                 |                                 | Tiruchirappalli (South). |
|                             | Total ..               | 1,340.50             |                                 |                          |
|                             | 2 Wilt ..              | 7.00                 |                                 | Tiruchirappalli (North). |
|                             | Total for groundnut .. | 1,347.50             |                                 |                          |
| 2 Coconut ..                | 1 Stem bleeding.       | ..                   | 2,938                           | Nagercoil.               |
|                             |                        |                      | 1,847                           | Kumbakonam.              |
|                             |                        |                      | 260                             | Mayuram.                 |
|                             |                        |                      | 487                             | Pattukkottai.            |
|                             |                        |                      | 1,761                           | Thanjavur.               |
|                             |                        |                      | 300                             | Palayamkottai.           |
|                             |                        |                      | 356                             | Tiruchirappalli (North). |
|                             |                        |                      | 12                              | Tiruchirappalli (South). |
|                             | Total ..               | ..                   | 7,911                           |                          |
| 2 Leaf diseases ..          |                        | ..                   | 2,498                           | Nagercoil.               |
|                             |                        |                      | 2,833                           | Kumbakonam.              |
|                             |                        |                      | 310                             | Thanjavur.               |
|                             |                        |                      | 400                             | Pattukkottai.            |
|                             |                        |                      | 175                             | Tiruchirappalli (South). |
|                             | Total ..               | ..                   | 6,216                           |                          |
| 3 Bud-rot ..                |                        | ..                   | 170                             | Nagercoil.               |
|                             |                        |                      | 65                              | Sattur.                  |
|                             |                        |                      | 3                               | Sivaganga.               |
|                             |                        |                      | 200                             | Palayamkottai.           |
|                             |                        |                      | 1,200                           | Pattukkottai.            |
|                             | Total ..               | ..                   | 1,638                           |                          |
| 4 Gonaderma ..              |                        | ..                   | 10                              | Kumbakonam.              |
| Total for coconut ..        |                        | ..                   | 15,775                          | Nos.                     |
| Grand total for oilseeds .. |                        | 1,347.00             | 15,775                          | Nos.                     |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (a) SOUTHERN REGION—cont.

| Serial number and crop. | Disease.               | Area tackled Ac./No. | Estimated gain in tons/ rupees. | Districts.               |
|-------------------------|------------------------|----------------------|---------------------------------|--------------------------|
| (1)                     | (2)                    | (3)                  | (4)                             | (5)                      |
| Fruit trees—            |                        |                      |                                 |                          |
| 15 Citrus ..            | 1 Canker and die back. | ..                   | 1,586                           | Dindigul.                |
|                         |                        |                      | 1,880                           | Madurai.                 |
|                         |                        |                      | 5,272                           | Sattur.                  |
|                         |                        |                      | 135                             | Sivaganga.               |
|                         |                        |                      | 2,355                           | Kumbakonam.              |
|                         |                        |                      | 2,110                           | Mayuram.                 |
|                         |                        |                      | 20                              | Pattukkottai.            |
|                         |                        |                      | 1,157                           | Tanjore.                 |
|                         |                        |                      | 5,354                           | Palayamkottai.           |
|                         |                        |                      | 16,400                          | Sankarankoil.            |
|                         |                        |                      | 8,454                           | Tiruchirappalli (North). |
|                         |                        |                      | 2,789                           | Tiruchirappalli (South). |
|                         | Total ..               | ..                   | 47,512                          |                          |
| 2 Folliceliosis ..      |                        | ..                   | 7,065                           | Dindigul.                |
|                         |                        |                      | 80                              | Madurai.                 |
|                         |                        |                      | 50                              | Sivaganga.               |
|                         |                        |                      | 189                             | Thanjavur.               |
|                         |                        |                      | 700                             | Palayamkottai.           |
|                         |                        |                      | 1,370                           | Tiruchirappalli (North). |
|                         | Total ..               | ..                   | 9,454                           |                          |
| 3 Nitrogen ..           |                        | ..                   | 190                             | Thanjavur.               |
| 4 Gonaderma ..          |                        | ..                   | 15                              | Kumbakonam.              |
| 5 Gummosis ..           |                        | ..                   | 1,450                           | Dindigul.                |
| 6 Powdery mildew.       |                        | ..                   | 550                             | Do.                      |
| Total for citrus ..     |                        | ..                   | 59,171                          |                          |
| 2 Mango ..              | 1 Mildew               | ..                   | 9,174                           | Dindigul.                |
|                         |                        |                      | 8,762                           | Madurai.                 |
|                         |                        |                      | 200                             | Sattur.                  |
|                         |                        |                      | 1,577                           | Kumbakonam.              |
|                         |                        |                      | 70                              | Pattukkottai.            |
|                         |                        |                      | 210                             | Thanjavur.               |
|                         |                        |                      | 115                             | Tiruchirappalli (North). |
|                         | Total ..               | ..                   | 20,108                          |                          |
| 2 Die back ..           |                        | ..                   | 243                             | Nagercoil.               |
|                         |                        |                      | 68                              | Pattukkottai.            |
| Total ..                |                        | ..                   | 311                             |                          |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) FOR SOUTHERN REGION—cont.

| Serial number and crop. | Disease.                       | Area tackled Ac./No.                             | Estimated gain in tons rupees. | District.                                                                                              |
|-------------------------|--------------------------------|--------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------|
| (1)                     | (2)                            | (3)                                              | (4)                            | (5)                                                                                                    |
| Fruit trees—cont.       |                                |                                                  |                                |                                                                                                        |
| 2 Mango—cont.           | 3 Sooty mould ..               | ..                                               | 150                            | Nagercoil.                                                                                             |
|                         | 4 Wilt .. ..                   | ..                                               | 10                             | Palayamkottai.                                                                                         |
|                         | 5 Leaf blight ..               | ..                                               | 75                             | Sattur.                                                                                                |
|                         |                                |                                                  | 662                            | Sivaganga.                                                                                             |
|                         |                                |                                                  | 120                            | Thanjavur.                                                                                             |
|                         |                                |                                                  | 245                            | Tiruchirappalli (South).                                                                               |
|                         | Total .. ..                    | ..                                               | 1,102                          |                                                                                                        |
|                         | Grand total for mango ..       | ..                                               | 21,681                         | Tons.                                                                                                  |
| 3 Apple ..              | Fruit-rot ..                   | ..                                               | 50                             | Dindigul.                                                                                              |
| 4 Cashew ..             | Leaf diseases ..               | ..                                               | 300                            | Sivaganga.                                                                                             |
| 5 Miscellaneous.        | Die-back ..                    | ..                                               | 18                             | Nagercoil.                                                                                             |
|                         |                                |                                                  | 30                             | Kumbakonam.                                                                                            |
|                         |                                |                                                  | 52                             | Pattukottai.                                                                                           |
|                         | Total .. ..                    | ..                                               | 109                            |                                                                                                        |
| 6 Grapevine.            | 1 Downy mildew.                | 815.80<br>415.00<br>1.00<br>0.50<br>6.00<br>0.50 |                                | Madurai.<br>Dindigul.<br>Sattur.<br>Thanjavur.<br>Tiruchirappalli (North).<br>Tiruchirappalli (South). |
|                         | Total .. ..                    | 1,238.80                                         |                                |                                                                                                        |
|                         | 2 Downy mildew.                | 770.00<br>603.00<br>3.00                         |                                | Madurai.<br>Dindigul.<br>Tiruchirappalli (North).                                                      |
|                         | Total .. ..                    | 1,376.00                                         |                                |                                                                                                        |
|                         | Total for grape-vine ..        | 2,614.50                                         |                                |                                                                                                        |
|                         | Grand total for fruit trees .. | 2,614.50                                         | acres.                         |                                                                                                        |
|                         | (Acs./Nos.) ..                 | 81,311                                           |                                |                                                                                                        |

## APPENDIX No. 24—cont.

Statement showing the diseases tackled and savings effected during the year 1959-60—cont.

## (b) FOR SOUTHERN REGION—cont.

| Serial number and crop. | Disease.                                | Area tackled Ac./No. | Estimated gain in tons rupees. | District.               |
|-------------------------|-----------------------------------------|----------------------|--------------------------------|-------------------------|
| (1)                     | (2)                                     | (3)                  | (4)                            | (5)                     |
| 16 Cardamom ..          | Leaf diseases ..                        | 375.00               |                                | Madurai.                |
| 17 Coffee ..            | Do. ..                                  | 1.00<br>3,460.00     |                                | Nagercoil.<br>Dindigul. |
|                         | Total ..                                | 3,461.00             |                                |                         |
| 18 Tea ..               | Blisterblight ..                        | 8,400.00             |                                | Madurai.                |
| 19 Rubber ..            | Powdery mildew.                         | 50.00<br>..          | 2,250<br>2,850                 | Dindigul.<br>Nagercoil. |
|                         | Total ..                                | 50.00                | 5,100                          |                         |
| 20 Areca ..             | Mahali ..                               | 108.50<br>..         | 2,298<br>130                   | Nagercoil.<br>Mayuram.  |
|                         | Total ..                                | 108.50               | 2,428                          |                         |
|                         | Stem bleeding ..                        | 1.00                 | ..                             | Do.                     |
|                         | Grand, total for other crops and trees. | 64,122<br>0.9        | ..                             |                         |
|                         | (No.) ..                                | 1,04,614             | ..                             |                         |

## APPENDIX No. 25.

## List of sugar factories in the Madras State which manufactured white sugar during 1959-60 season.

| Name of the factory.                                    | Location.                           | District.                | Average daily crushing capacity. | Total number of working days. | Total quantity of cane crushed. | Total quantity of sugar produced. |
|---------------------------------------------------------|-------------------------------------|--------------------------|----------------------------------|-------------------------------|---------------------------------|-----------------------------------|
| (1)                                                     | (2)                                 | (3)                      | (4)                              | (5)                           | (6)                             | (7)                               |
| 1 East India Distilleries and Sugar Factories, Limited. | Nellikuppam                         | South Arcot district     | 2,200                            | 184                           | 3,44,147.28                     | 31,229.4                          |
| 2 Thiru Arooran Sugars, Limited.                        | Vadapathimangalam                   | Thanjavur district       | 1,000                            | 161                           | 1,61,859.00                     | 11,146.30                         |
| 3 Decan Sugars and Abkari Company, Limited.             | Pugalur                             | Tiruchirappalli district | 800                              | 214                           | 1,82,803.00                     | 18,475.3                          |
| 4 Madura Sugars and Allied Products, Limited.           | Pandiyarajapuram                    | Madurai district         | 300                              | 176                           | 46,269.00                       | 4,248.7                           |
| 5 Cauvery Sugars and Chemicals, Limited.                | Pettaivaithalai (Kulithalai taluk). | Tiruchirappalli district | 800                              | 177                           | 99,835.88                       | 10,613.56                         |

## APPENDIX No. 26.

Districtwar production and distribution of compost manure by municipalities and panchayats during 1959-60 (from July 1959 to June 1960).

| District.                     | Production (TONS) | Distribution (TONS) |
|-------------------------------|-------------------|---------------------|
| (1)                           | (2)               | (3)                 |
| North Arcot .. .. .           | 21,057            | 17,071              |
| South Arcot .. .. .           | 17,706            | 15,730              |
| Chingleput .. .. .            | 12,416            | 8,910               |
| Thanjavur .. .. .             | 32,336            | 34,119              |
| Tiruchirappalli .. .. .       | 26,856            | 37,054              |
| Madurai .. .. .               | 109,426           | 69,746              |
| Ramanathapuram .. .. .        | 22,007            | 16,705              |
| Tirunelveli .. .. .           | 22,251            | 21,380              |
| Salem .. .. .                 | 28,360            | 26,111              |
| The Nilgiris .. .. .          | 5,873             | 5,819               |
| Kanyakumari .. .. .           | 2,880             | 2,035               |
| Coimbatore .. .. .            | 47,884            | 47,650              |
| Corporation of Madras .. .. . | 12,334            | 10,925              |
| Total .. .. .                 | 361,386           | 313,255             |

## APPENDIX No. 27.

Appointments, postings and transfers of gazetted officers from 1st July 1959 to 30th June 1960.

| Name of the post.                                                 | Period.                    |                             | Name of the officer-in-charge.                             |
|-------------------------------------------------------------------|----------------------------|-----------------------------|------------------------------------------------------------|
| (1)                                                               | From                       | To                          | (3)                                                        |
| MADRAS CITY.                                                      |                            |                             |                                                            |
| Director of Agriculture, Madras.                                  | Throughout.                |                             | Sri A. Venkatesan, I.A.S.                                  |
| Joint Director of Agriculture (Planning and Development), Madras. | 1 July 1959. 7 Apr. 1960.  | 6 Apr. 1960. 16 May 1960.   | „ C. R. Seshadri.                                          |
|                                                                   | 17 May 1960.               | 30 June 1960.               | „ S. M. Sulaiman, J.D.A. (I. and G.) in-charge.            |
| Joint Director of Agriculture (Engineering), Madras.              | 1 July 1959. 22 June 1960. | 21 June 1960. 30 June 1960. | „ C. R. Seshadri.                                          |
|                                                                   |                            |                             | „ N. Sankaranarayana Reddy.                                |
|                                                                   |                            |                             | „ R. M. Chidambaram, Deputy Director (Drilling) in-charge. |
| Joint Director of Agriculture (State Seed Farm), Madras.          | 1 July 1959.               | Do.                         | „ Md. Obeidullah Shah.                                     |
| Joint Director of Agriculture (Extension), Madras.                | Do. 8 Nov. 1959.           | 7 Nov. 1959. 12 Feb. 1960.  | „ S. M. Sulaiman.                                          |
|                                                                   |                            |                             | „ A. Mohamad Ali (J.D.A.) (I. and G.) in-charge.           |
|                                                                   | 13 Feb. 1960.              | 29 Feb. 1960.               | „ T. S. Francis.                                           |
|                                                                   | 1 Mar. 1960.               | 13 Mar. 1960.               | „ A. Md. Ali (J.D.A.) (I. and G.) in-charge.               |



## APPENDIX No. 27—cont.

*Appointments, postings and transfers of gazetted officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                               | Period.                                                       |                                                                 | Name of Officer-in-charge                                                                                                                    |
|-----------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | From                                                          | To                                                              |                                                                                                                                              |
| (1)                                                             | (2)                                                           | (3)                                                             | (4)                                                                                                                                          |
| MADRAS CITY—cont.                                               |                                                               |                                                                 |                                                                                                                                              |
| Joint Director of Agricultural (Extension), Madras.             | 14 Mar. 1960.<br>3 May 1960.<br>13 May 1960.<br>14 June 1960. | 2 May 1960.<br>12 May 1960.<br>13 June 1960.<br>30 June 1960.   | Sri T. S. Francis.<br>Vacant.<br>„ T. S. Francis.<br>„ S. M. Sulaiman (J.D.A.)<br>(I. and G. in-charge).                                     |
| Joint Director of Agriculture (Inspection and General), Madras. | 1 July 1959.<br>2 Apr. 1960.                                  | 1 Apr. 1960.<br>6 Apr. 1960.                                    | „ A. Mohammed Ali.<br>„ Md. Obeidullah Shah,<br>(in-charge).                                                                                 |
| Agricultural Engineer, Madras.                                  | 7 Apr. 1960.<br>1 July 1959.<br>13 May 1960.                  | 30 June 1960.<br>12 May 1960.<br>22 May 1960.                   | „ S. M. Sulaiman.<br>„ C. S. Sridharan.<br>„ N. Sankaranarayana<br>Reddy, (in-charge).                                                       |
| Personal Assistant to the Director of Agriculture, Madras.      | 23 May 1960.                                                  | 30 June 1960.                                                   | „ K. Natarajan.                                                                                                                              |
| Accounts Officer, Madras.                                       | Throughout.                                                   |                                                                 | „ K. S. Narasimha Mudaliar.                                                                                                                  |
| Junior Accounts Officer, Madras.                                | 1 July 1959.                                                  | 7 Mar. 1960.                                                    | „ K. T. Karunakaran.                                                                                                                         |
| Junior Accounts Officer (Soil Conservation), Madras.            | 8 Mar. 1960.                                                  | 30 June 1960.                                                   | „ S. Veerabahu, Junior<br>Accounts Officer (Soil<br>Conservation) (in-<br>charge).                                                           |
| Gazetted Assistant, Madras.                                     | 1 July 1959.<br>1 Jan. 1960.<br>1 Apr. 1960.<br>1 June 1960.  | 31 Dec. 1959.<br>31 Mar. 1960.<br>31 May 1960.<br>30 June 1960. | „ G. Ramachandran.<br>„ S. Veerabahu.<br>„ C. Ekambaram.<br>Vacant.<br>„ C. Ekambaram.<br>„ C. R. Seshadri, J.D.A.<br>(P. and D. in-charge.) |
| Administrative Officer I, Madras.                               | Throughout.                                                   |                                                                 | „ A. Kitchanan.                                                                                                                              |
| Administrative Officer II, Madras.                              | 1 July 1959.<br>27 Mar. 1960.                                 | 26 Mar. 1960.<br>30 June 1960.                                  | „ R. Ratnam.<br>„ V. Krishnamurthy.                                                                                                          |
| Assistant Agricultural Engineer (Head-quarters), Madras.        | 1 July 1959.<br>17 Aug. 1959.                                 | 16 Aug. 1959.<br>31 Aug. 1959.                                  | „ S. Gonsalves.<br>„ C. S. Sridharan (in-<br>charge).                                                                                        |
| Agricultural Information Officer, Madras.                       | 1 Sep. 1959.<br>30 Dec. 1959.<br>1 Jan. 1960.<br>5 June 1960. | 29 Dec. 1959.<br>31 Dec. 1959.<br>4 June 1960.<br>30 June 1960. | „ S. Gonsalves.<br>Vacant.<br>„ S. Gonsalves<br>„ P. K. Radhakanth.<br>„ M. J. David.                                                        |
| Campaign Officer, Madras.                                       | 1 July 1959.                                                  | 30 June 1960.                                                   | „ S. V. Ramachandran.                                                                                                                        |
| Chief Inspector of Fertilizers, Madras.                         | Throughout.                                                   |                                                                 | „ S. Muthuswamy Iyer.                                                                                                                        |
| Deputy Director (Drilling), Madras.                             | Throughout.                                                   |                                                                 | „ R. M. Chidambaram.                                                                                                                         |
| Stock Verifier, Madras.                                         | Throughout.                                                   |                                                                 | „ R. Alagiriswamy.                                                                                                                           |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                | Period.                                       |                                                 | Name of Officer.                                                                  |
|------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------|
|                                                                  | From                                          | To                                              |                                                                                   |
| (1)                                                              | (2)                                           | (3)                                             | (4)                                                                               |
| MADRAS CITY—cont.                                                |                                               |                                                 |                                                                                   |
| State Marketing Officer, Madras.                                 | Throughout.                                   |                                                 | Sri D. Shanmugasundaram.                                                          |
| General Superintendent, Industrial Engineering Workshop, Madras. | 1 July 1959.<br>17 Aug. 1959.<br>1 Oct. 1959. | 16 Aug. 1959.<br>30 Sep. 1959.<br>30 June 1960. | „ T. S. Palanivelu.<br>„ R. M. Chidambaram<br>(in-charge).<br>„ T. S. Palanivelu. |
| Assistant Director (Drilling), Madras.                           | 1 July 1959.                                  | 30 June 1960.                                   | „ C. D. Sivasankaran.                                                             |
| Cane Development Officer, Madras.                                | 1 July 1959.<br>5 July 1959.                  | 4 July 1959.<br>30 June 1959.                   | Vacant.<br>„ S. Ramaswamy.                                                        |
| Compost Development Officer, Madras.                             | Throughout.                                   |                                                 | „ T. Rajagopala Iyengar.                                                          |
| Assistant Agricultural Engineer, M.B. Shed, Saidapet.            | Throughout.                                   |                                                 | „ C. A. Parangusados.                                                             |
| Assistant Marketing Officer (Propaganda and Publicity), Madras.  | 10 Nov. 1959.<br>17 May 1960.                 | 16 May 1960.<br>31 May 1960.                    | Sri V. G. Venkataramana<br>Rao.<br>„ W. S. Ramarathnam,<br>(in-charge).           |
| Assistant Marketing Officer (Upgraded post), Madras.             | 1 June 1960.                                  | 30 June 1960.                                   | „ V. G. Venkataramana<br>Rao.                                                     |
| Assistant Marketing Officer (Survey), Madras.                    | 2 Oct. 1959.                                  | 30 June 1960.                                   | „ K. Narayana Nayar.                                                              |
| Assistant Marketing Officer (Agmark), Madras.                    | 22 Feb. 1960.                                 | 30 June 1960.                                   | „ P. N. Seetharaman.                                                              |
| Assistant Marketing Officer (Regulated Markets), Madras.         | 1 Mar. 1960.                                  | 30 June 1960.                                   | „ K. Sriraman.                                                                    |
| Assistant Marketing Officer (Regulated Markets), Madras.         | 6 May 1960.                                   | 30 June 1960.                                   | „ W. S. Ramarathnam.                                                              |
| DISTRICTS.                                                       |                                               |                                                 |                                                                                   |
| Marketing Section.                                               |                                               |                                                 |                                                                                   |
| Assistant Marketing Officer, Tiruchirappalli.                    | Throughout.                                   |                                                 | Sri V. Nataraja Iyer.                                                             |
| Assistant Marketing Officer, Madurai.                            | Throughout.                                   |                                                 | „ P. Gopalakrishnan.                                                              |
| Agricultural College and Research Institute, Coimbatore.         |                                               |                                                 |                                                                                   |
| Dean .. .. .                                                     | 1 July 1959.<br>14 Aug. 1959.                 | 13 Aug. 1959.<br>30 June 1960.                  | Dr. K. C. Naik.<br>Dr. S. Krishnamurthy.                                          |
| Principal (now redesignated as Associate Dean).                  | 1 July 1959.<br>14 Aug. 1959.                 | 13 Aug. 1959.<br>30 June 1960.                  | Dr. S. Krishnamurthy.<br>Dr. A. Mariakulandai.                                    |
| Agronomist and Associate Professor of Agriculture.               | Throughout.                                   |                                                 | Sri T. Natarajan.                                                                 |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                    | Period.       |               | Name of the officer-<br>in-charge.   |
|----------------------------------------------------------------------|---------------|---------------|--------------------------------------|
|                                                                      | From          | To            |                                      |
| (1)                                                                  | (2)           | (3)           | (4)                                  |
| DISTRICTS—cont.                                                      |               |               |                                      |
| <i>Agricultural College and Research Institute, Coimbatore—cont.</i> |               |               |                                      |
| Lecturer in Agriculture.                                             | 1 July 1959.  | 14 Aug. 1959. | Sri N. Ranganathachari.              |
|                                                                      | 15 Aug. 1959. | 31 Oct. 1959. | „ G. Venkataramana.                  |
|                                                                      | 1 Nov. 1959.  | 10 May 1960.  | „ M. Damodara Prabhu.                |
|                                                                      | 11 May 1960.  | 12 June 1960. | „ G. Venkataramana, (In-charge).     |
| Additional Lecturer in Agriculture.                                  | 13 June 1960. | 30 June 1960. | „ M. Damoda Prarabhu.                |
|                                                                      | 1 July 1959.  | 31 Oct. 1959. | „ M. Damodara Prabhu..               |
|                                                                      | 1 Nov. 1959.  | 30 June 1960. | „ G. Venkataramana.                  |
| Lecturer in Agricultural Economics.                                  | 1 July 1959.  | 7 June 1960.  | „ S. V. Doraiswamy.                  |
|                                                                      | 8 June 1960.  | 30 June 1960. | „ M. Ramachandran, (In-charge).      |
| Additional Lecturer in Agricultural Economics.                       | 1 July 1959.  | 30 June 1960. | „ M. Ramachandran.                   |
| Lecturer in Entomology-I.                                            | 1 July 1959.  | 4 Mar. 1960.  | Dr. S. Kanakaraj David.              |
|                                                                      | 5 Mar. 1960.  | 7 Mar. 1960.  | „ S. Kanakaraj David, (In-charge).   |
|                                                                      | 8 Mar. 1960.  | 30 June 1960. | Sri K. R. Nagaraja Rao.              |
| Lecturer in Entomology-II.                                           | 1 July 1959.  | 16 May 1960.  | „ T. Santhanaraman.                  |
|                                                                      | 17 May. 1960. | 15 June 1960. | „ S. Venugopal, (In-charge).         |
|                                                                      | 16 June 1960. | 30 June 1960. | „ T. Santhanaraman.                  |
| Lecturer in Entomology-III.                                          | 1 July 1959.  | 10 Nov. 1959. | „ K. R. Nagaraja Rao.                |
|                                                                      | 11 Nov. 1959. | 15 Nov. 1960. | „ T. R. Subramayam.                  |
|                                                                      | 16 Apr. 1960. | 4 May 1960.   | „ T. Santhanaraman, (In-charge).     |
|                                                                      | 5 May 1960.   | 30 June 1960. | „ S. Venugopal.                      |
| Lecturer in Mycology I.                                              | 1 July 1959.  | 31 July 1959. | „ M. Kandaswamy.                     |
|                                                                      | 1 Aug. 1959.  | 10 Nov. 1959. | „ M. Kandaswamy, (In-charge).        |
|                                                                      | 11 Nov. 1959. | 30 June 1960. | Srimathi C. K. Sowmani Rajagopalan.  |
| Lecturer in Mycology II.                                             | 1 July 1959.  | 31 Aug. 1959. | Sri M. Kandaswamy, (in-charge).      |
|                                                                      | 1 Sep. 1959.  | 10 Nov. 1959. | „ C. V. Govindaswamy, (in-charge).   |
|                                                                      | 11 Nov. 1959. | 30 June 1959. | „ A. P. Sarojini Damodaran.          |
| Lecturer in Chemistry I.                                             | 1 July 1959.  | 30 Apr. 1960. | „ S. Varadarajan.                    |
|                                                                      | 1 May 1960.   | 14 June 1960. | „ T. N. Ananthanarayana (in-charge). |
|                                                                      | 15 June 1960. | 30 June 1960. | „ S. Varadarajan.                    |
| Lecturer in Chemistry-II.                                            | 1 July 1959.  | 10 Nov. 1959. | „ S. Varadarajan, (in-charge).       |
|                                                                      | 11 Nov. 1959. | 11 Apr. 1960. | „ C. K. Rajagopal.                   |
|                                                                      | 12 Apr. 1960. | 30 June 1960. | „ T. S. Lakshmanan, (in-charge).     |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                    | Period.       |               | Name of the officer.                         |
|----------------------------------------------------------------------|---------------|---------------|----------------------------------------------|
|                                                                      | From          | To            |                                              |
| (1)                                                                  | (2)           | (3)           | (4)                                          |
| DISTRICTS—cont.                                                      |               |               |                                              |
| <i>Agricultural College and Research Institute, Coimbatore—cont.</i> |               |               |                                              |
| Lecturer in Chemistry-III.                                           | 1 July 1959.  | 14 Jan. 1960. | Sri T. S. Lakshmanan.                        |
|                                                                      | 15 Jan. 1960. | 14 Feb. 1960. | „ S. Varadarajan.                            |
|                                                                      | 15 Feb. 1960. | 30 June 1960. | „ T. S. Lakshmanan                           |
| Systematic Botanist and Associate Professor of Botany.               | Throughout.   |               | „ D. Daniel Sundararaj.                      |
| Lecturer in Botany-I.                                                | 1 July 1959.  | 28 July 1959. | „ D. Daniel Sundararaj. (in-charge).         |
|                                                                      | 29 July 1959. | 30 Apr. 1960. | Srimathi Girija Balasubramanyam.             |
|                                                                      | 1 May 1960.   | 31 May 1960.  | Sri J. Saktharama Rao, (in-charge).          |
|                                                                      | 1 June 1960.  | 30 June 1960. | Srimathi Girija Balasubramaniyam.            |
| Lecturer in Botany-II.                                               | 1 July 1959.  | 14 Sep. 1959. | Srimathi Girija Balasubramanyam (in-charge). |
|                                                                      | 15 Sep. 1959. | 15 Mar. 1960. | Sri V. Ramakrishnan.                         |
|                                                                      | 16 Mar. 1960. | 5 Apr. 1960.  | „ V. Ramakrishnan (in-charge).               |
|                                                                      | 6 Apr. 1960.  | 30 June 1960. | „ J. Saktharama Rao.                         |
| Lecturer in Animal Husbandry.                                        | Throughout.   |               | „ C. A. Gopalakrishnan.                      |
| Professor of Animal Husbandry.                                       | Throughout.   |               | „ S. Krishnaswamy.                           |
| Lecturer in Civil Engineering.                                       | 1 July 1959.  | 30 June 1960. | „ R. K. Sivanappan.                          |
| Lecturer in Mechanical Engineering.                                  | 1 July 1959.  | 18 Sep. 1959. | „ P. K. Radhakanth.                          |
|                                                                      | 19 Sep. 1959. | 22 June 1960. | „ S. E. Anantha Raman. (in-charge).          |
|                                                                      | 23 June 1960. | 30 June 1960. | „ K. T. Narayanan                            |
| Professor of Agricultural Engineering.                               | 1 July 1959.  | 30 June 1960. | „ S. E. Anantha Raman.                       |
| Lecturer in Horticulture.                                            | Throughout.   |               | „ S. Muthuswamy.                             |
| Administrative Officer.                                              | 1 July 1959.  | 14 Sep. 1959. | „ K. V. Tandoni Rao.                         |
|                                                                      | 15 Sep. 1959. | 8 Nov. 1959.  | „ G. Ramachandran. (in-charge).              |
|                                                                      | 9 Nov. 1959.  | 31 Mar. 1960. | „ C. V. Nagaraja Rao.                        |
|                                                                      | 1 Apr. 1960.  | 30 June 1960. | „ R. Ratnam.                                 |
| Junior Accounts Officer.                                             | 1 July 1959.  | 29 Feb. 1960. | „ G. Ramachandran.                           |
|                                                                      | 1 Mar. 1960.  | 17 June 1960. | „ P. S. Panchanathan.                        |
|                                                                      | 18 June 1960. | 30 June 1960. | „ S. Narayanan.                              |
| <i>Post-Graduate Research Institute, Coimbatore.</i>                 |               |               |                                              |
| Professor of Plant Pathology.                                        | 1 July 1959.  | 20 Jan. 1960. | Vacant.                                      |
|                                                                      | 21 Jan. 1960. | 30 June 1960. | Dr. K. Ramakrishnan.                         |

## APPENDIX No. 27—cont.

Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.

| Name of the post.                                  | Period.       |               | Name of the officer-in-charge.     |
|----------------------------------------------------|---------------|---------------|------------------------------------|
|                                                    | From          | To            |                                    |
| (1)                                                | (2)           | (3)           | (4)                                |
| DISTRICTS—cont.                                    |               |               |                                    |
| Post-Graduate Research Institute, Coimbatore—cont. |               |               |                                    |
| Professor of Soil Science.                         | 1 July 1959.  | 13 Aug. 1959. | Sri R. Soundara Rajan (in-charge.) |
|                                                    | 14 Aug. 1959. | 15 Sep. 1959. | Dr. A. Mariakulandai, (in-charge.) |
|                                                    | 16 Sep. 1959. | 6 Apr. 1960.  | Sri R. Soundara Rajan (in-charge.) |
|                                                    | 7 Apr. 1960.  | 30 June 1960. | Sri D. John Dorairaj, (in-charge.) |
| Professor of Agronomy.                             | 16 Sep. 1959. | 30 June 1960. | Dr. A. Mariakulandai (in-charge.)  |
| Reader in Genetics.                                | 1 July 1959.  | 27 Sep. 1959. | „ V. Santhanam.                    |
|                                                    | 28 Sep. 1959. | 4 Oct. 1959.  | Sri T. R. Narayanan, (in-charge.)  |
|                                                    | 5 Oct. 1959.  | 5 Apr. 1960.  | Dr. V. Santhanam.                  |
|                                                    | 6 Apr. 1960.  | 30 June 1960. | „ V. S. Raman.                     |
| Reader in Entomology                               | 5 Mar. 1960.  | 30 June 1960. | „ S. Kanakaraj David.              |
| Reader in Soil Science.                            | 1 July 1959.  | 6 Apr. 1960.  | Sri R. Soundara Rajan.             |
|                                                    | 7 Apr. 1960.  | 30 June 1960. | „ D. John Dorairaj.                |
| Reader in Horticulture.                            | 1 July 1959.  | 7 Oct. 1959.  | Dr. K. S. Venkataraman.            |
|                                                    | 8 Oct. 1959.  | 30 June 1960. | Sri V. N. Madhava Rao.             |
| Professor of Horticulture.                         | 1 July 1959.  | 30 June 1960. | Dr. S. Krishnamurthy, (in-charge.) |
| Professor of Plant Genetics.                       | 1 July 1959.  | 14 Nov. 1959. | Sri T. R. Narayanan.               |
|                                                    | 15 Nov. 1959. | 30 June 1960. | Dr. B. W. X. Ponnayya.             |
| Reader in Plant Pathology.                         | 1 July 1959.  | 31 Mar. 1960. | Sri C. V. Govindaswamy             |

Note.—Post retrenched from 31st March 1960, a.m.

## RESEARCH SECTIONS.

## Agronomy Section.

|                                         |              |               |                        |
|-----------------------------------------|--------------|---------------|------------------------|
| Superintendent Central Farm.            | 1 July 1959. | 1 Nov. 1959.  | Sri S. Muthuswamy.     |
|                                         | 2 Nov. 1959. | 30 June 1960. | „ V. Muthuperumal.     |
| Additional Superintendent Central Farm. | Throughout.  |               | „ S. Rajarathnam Chett |
| Agricultural Meteorologist.             | Throughout.  |               | „ C. Balasubramaniam   |

## Paddy Section.

|                             |              |               |                                    |
|-----------------------------|--------------|---------------|------------------------------------|
| Paddy Specialist.           | 1 July 1959. | 29 Feb. 1960. | Sri A. Abdul Samad.                |
|                             | 1 Mar. 1960. | 31 Mar. 1960. | „ A. Shanmugasundaram (in-charge.) |
|                             | 1 Apr. 1960. | 30 June 1960. | „ A. Abdul Samad.                  |
| Assistant Paddy Specialist. | 1 July 1959. | 31 Mar. 1960. | „ A. Shanmugasundaram              |
|                             | 1 Apr. 1960. | 30 June 1960. | „ K. Rajagopalan.                  |

## APPENDIX No. 27—cont.

Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.

| Name of the post.                                             | Period.       |               | Name of the officer-in-charge.      |
|---------------------------------------------------------------|---------------|---------------|-------------------------------------|
|                                                               | From          | To            |                                     |
| (1)                                                           | (2)           | (3)           | (4)                                 |
| RESEARCH SECTIONS—cont.                                       |               |               |                                     |
| Paddy Section—cont.                                           |               |               |                                     |
| Assistant Specialist Paddy (Seed Dormancy Scheme).            | 20 Jan. 1960. | 22 Feb. 1960. | Sri S. T. Srinivasan.               |
|                                                               | 23 Feb. 1960. | 18 Mar. 1960. | „ K. Rajagopalan (in-charge.)       |
|                                                               | 19 Mar. 1960. | 31 Mar. 1960. | „ S. T. Srinivasan.                 |
|                                                               | 1 Apr. 1960.  | 30 June 1960. | „ A. Shanmugasundaram.              |
| Assistant Specialist, Paddy Thalainayar, Tanjore district.    | 20 July 1959. | 30 June 1960. | „ V. Krishnaswamy.                  |
| Assistant Specialist, Paddy (Peravurni (Thanjavur district).) | 17 Dec. 1959. | 31 Mar. 1960. | „ K. Rajagopalan.                   |
|                                                               | 1 Apr. 1960.  | 30 June 1960. | „ S. T. Srinivasan.                 |
| Cotton Section.                                               |               |               |                                     |
| Cotton Specialist.                                            | 1 July 1959.  | 17 Nov. 1959. | Sri L. Neelakantan.                 |
|                                                               | 18 Nov. 1959. | 1 May. 1960.  | „ C. K. Ramachandran, (in-charge.)  |
|                                                               | 2 May 1960.   | 30 June 1960. | „ C. K. Ramachandran.               |
| Assistant Specialist, Cotton Srivilliputhur.                  | 1 July 1959.  | 3 Aug. 1959.  | „ K. Kanniau.                       |
|                                                               | 4 Feb. 1959.  | 25 Mar. 1960. | „ N. G. Narayanan, (in-charge.)     |
|                                                               | 26 Mar. 1960. | 30 June 1960. | „ S. Iyemperumal.                   |
| Assistant Specialist, Cotton Karunganni (Koilpatti).          | 1 July 1959.  | 1 Oct. 1959.  | „ C. S. Krishnan.                   |
|                                                               | 2 Oct. 1959.  | 18 Mar. 1960. | „ V. D. Guruswamy Raja (in-charge.) |
| Assistant Specialist, Cotton (K2 Co.4), Koilpatti.            | 19 Mar. 1960. | 30 June 1960. | „ R. S. Annapparao.                 |
|                                                               | Throughout.   |               | „ V. D. Guruswamy Raja              |
| Assistant Specialist, Cotton Tiruppur.                        | Throughout.   |               | „ R. Sambandam.                     |
| Certification Officer, Rajapalayam.                           | 1 July 1959.  | 26 Apr. 1960. | „ N. G. Narayanan.                  |
|                                                               | 27 Apr. 1960. | 30 June 1960. | „ P. N. Krishnaswamy (in-charge.)   |
| Gazetted Assistant to Certification Officer, Rajapalayam.     | 1 July 1959.  | 30 Aug. 1959. | „ T. B. Krishnaswamy Rao.           |
|                                                               | 31 Aug. 1959. | 15 Oct. 1959. | „ N. G. Narayanan (in-charge.)      |
|                                                               | 16 Oct. 1959. | 30 June 1960. | „ P. N. Krishnaswamy Rao.           |

## APPENDIX No. 27—cont.

Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont

| Name of the post.                                       | Period.       |               | Name of the Officer-in-charge.     |
|---------------------------------------------------------|---------------|---------------|------------------------------------|
|                                                         | From          | To            |                                    |
| (1)                                                     | (2)           | (3)           | (4)                                |
| RESEARCH SECTIONS—cont.                                 |               |               |                                    |
| Millets and Pulses Section.                             |               |               |                                    |
| Millet and Pulses Specialist.                           | 1 July 1959.  | 14 Nov. 1959. | Sri B. W. X. Ponnayya.             |
|                                                         | 15 Nov. 1959. | 26 Nov. 1959. | „ A. Subramanyan (in-charge).      |
|                                                         | 27 Nov. 1959. | 30 June 1960. | „ S. G. Ayyadurai.                 |
| Assistant Millet Specialist (Dolichos Lab Lab).         | 15 July 1959. | 30 June 1960. | „ A. Subramanyam.                  |
| Assistant Millet Specialist, Sathyamangalam.            | Throughout.   |               | „ R. Veeraswamy.                   |
| Oil Seeds Section.                                      |               |               |                                    |
| Oil Seeds Specialist.                                   | 1 July 1959.  | 10 Feb. 1960. | Sri M. Bhavanisankar Rao           |
|                                                         | 11 Feb. 1960. | 25 Feb. 1960. | Vacant.                            |
|                                                         | 26 Feb. 1960. | 30 June 1960. | „ S. G. Ayyadurai (in-charge).     |
| Assistant Oil Seeds Specialist, Pollachi.               | 1 July 1959.  | 6 Sep. 1959.  | „ N. Srinivasalu.                  |
|                                                         | 7 Sep. 1959.  | 26 Nov. 1959. | „ S. G. Ayyadurai.                 |
|                                                         | 27 Nov. 1959. | 14 Dec. 1959. | „ E. G. Sivaswamy, (in-charge.)    |
|                                                         | 15 Dec. 1959. | 24 Mar. 1960. | „ P. P. Syed Muhamed (in-charge).  |
|                                                         | 25 Mar. 1960. | 30 June 1960. | „ V. Subbiah.                      |
| Assistant Oil Seeds Specialist, Karur.                  | 15 Sep. 1959. | 30 June 1960. | „ N. Srinivasalu.                  |
| Assistant Oil Seeds Specialist, Salem.                  | 25 Mar. 1960. | 30 June 1960. | N. R. Chandrasekaran.              |
| Assistant Oil Seeds Specialist, Pattukottai.            | Throughout.   |               | „ P. A. Muhamad Ibrahim.           |
| Cytogenetisist (Groundnut).                             | 1 July 1959.  | 24 June 1960. | „ P. Chandrasekaran (in-charge).   |
|                                                         | 25 Sep. 1960. | 29 June 1960  | „ D. Daniel Sundararaj (incharge.) |
| (Post retrenched with effect from 29th June 1960 a.n.)  |               |               |                                    |
| Horticultural Section.                                  |               |               |                                    |
| Horticulturist and Associate Professor of Horticulture. | 1 July 1959.  | 15 Oct. 1959. | Vacant.                            |
|                                                         | 16 Oct. 1959. | 30 June 1960. | Sri J. Samuel Sundararaj.          |
| Horticulturist, Periyakulam.                            | 1 July 1959.  | 8 Oct. 1959.  | „ J. Samuel Sundararaj.            |
|                                                         | 9 Oct. 1959.  | 30 June 1960. | „ R. Bettai Gowder.                |

## AGRICULTURAL DEPARTMENT

## APPENDIX No. 27—cont.

Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.

| Name of the post.                                        | Period.       |               | Name of the Officer-in-charge.               |
|----------------------------------------------------------|---------------|---------------|----------------------------------------------|
|                                                          | From          | To            |                                              |
| (1)                                                      | (2)           | (3)           | (4)                                          |
| <b>RESEARCH SECTIONS—cont.</b>                           |               |               |                                              |
| <i>Horticultural Section—cont.</i>                       |               |               |                                              |
| Assistant Horticulturist (Vegetable Scheme), Coimbatore. | 1 July 1959.  | ..            | Sri K. R. Raman.                             |
|                                                          | 2 July 1959.  | 25 July 1959. | „ S. Muthuswamy (in-charge).                 |
|                                                          | 26 July 1959. | 30 June 1960. | „ K. R. Raman.                               |
|                                                          | Throughout.   |               | „ T. M. Venkatram.                           |
| Assistant Horticulturist Development Scheme, Coimbatore. |               |               |                                              |
| Banana Research Officer, Aduthurai.                      | 1 July 1959.  | 8 Oct. 1959.  | „ R. Bettai Gowder.                          |
|                                                          | 9 Oct. 1959.  | 25 Mar. 1960. | „ M. C. Appayyan (in-charge.)                |
|                                                          | 26 Mar. 1960. | 30 June 1960. | „ C. M. Bakthavathohalu.                     |
|                                                          | Throughout.   |               | „ B. S. Kuppuswamy.                          |
| Cashew Development Officer, Thanjavur.                   |               |               |                                              |
| Assistant Horticulturist, Cooroor.                       |               |               | „ K. P. Kuppuswamy.                          |
| Assistant Horticulturist, Kanyakumari.                   | 8 Apr. 1960.  | 30 June 1960. | „ N. Raghavan.                               |
| <i>Botany Section.</i>                                   |               |               |                                              |
| Systematic Botanist, and Associate Professor of Botany.  | Throughout.   |               | Sri D. Daniel Sundararaj.                    |
| Plant Physiologist.                                      | 1 July 1959.  | 16 Oct. 1959. | „ P. Chandrasekaran, (in-charge).            |
|                                                          | 17 Oct. 1959. | 30 June 1960. | „ S. Gopalakrishnan (in-charge).             |
| Cytogeneticist ..                                        | 1 July 1959.  | 5 Apr. 1960.  | „ V. S. Raman.                               |
|                                                          | 6 Apr. 1960.  | 30 June 1960. | „ V. S. Raman (in-charge).                   |
| Cytogeneticist (Fodder).                                 | 1 July 1959.  | 24 June 1960. | „ P. Chandrasekaran.                         |
|                                                          | 25 June 1960. | 30 June 1960. | Srimathi Girija Balasubramanyam (in-charge). |
| Fodder Research Officer.                                 | 1 July 1959.  | 28 July 1959. | Srimathi Girija Balasubramanyam (in-charge). |
|                                                          | 29 July 1959. | 30 June 1960. | Sri S. Madhava Rao.                          |
| Algologist, Coimbatore (new post).                       | 16 Mar. 1960. | 30 June 1960. | „ V. Ramakrishnan.                           |
| <i>Sugarcane Section.</i>                                |               |               |                                              |
| Sugarcane Specialist, Cuddalore.                         | 1 July 1959.  | 1 June 1960.  | Sri V. K. Appaji.                            |
|                                                          | 2 June 1960.  | 30 June 1960. | „ C. Ekambaram.                              |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                | Period.       |               | Name of the officer-in-charge.   |
|------------------------------------------------------------------|---------------|---------------|----------------------------------|
|                                                                  | From          | To            |                                  |
| (1)                                                              | (2)           | (3)           | (4)                              |
| <b>RESEARCH SECTIONS—cont.</b>                                   |               |               |                                  |
| <i>Sugarcane Section—cont.</i>                                   |               |               |                                  |
| Assistant Agricultural Chemist.                                  | 1 July 1959.  | 31 Mar. 1960. | Sri S. Venkatachalam.            |
|                                                                  | 1 Apr. 1960.  | 30 June 1960. | „ T. S. Govindan (in charge).    |
| Assistant Agronomist, Cuddalore.                                 | 1 Aug. 1959.  | 8 Mar. 1960.  | „ C. R. Thiruvengadam.           |
|                                                                  | 9 Mar. 1959.  | 1 June 1960.  | „ V. K. Appaji (in charge.)      |
|                                                                  | 2 June 1960.  | 30 June 1960. | „ C. Ekambaram (in charge.)      |
| Assistant Agronomist, Rajadanikottai.                            | 1 July 1959.  | 25 Dec. 1959. | „ K. Narayanan (in charge.)      |
|                                                                  | 26 Dec. 1959. | 10 June 1960. | „ J. Vaidyanathan.               |
|                                                                  | 11 June 1960. | 13 June 1960. | „ K. Narayanan (in charge.)      |
|                                                                  | 14 June 1960. | 30 June 1960. | „ J. Vaidyanathan.               |
| Assistant Agronomist, Lakshmangudi.                              | 1 July 1959.  | 30 Nov. 1959. | „ T. D. Muthuswamy.              |
|                                                                  | 1 Dec. 1959.  | 8 June 1960.  | „ V. Krishnamoorthy (in charge.) |
|                                                                  | 9 June 1960.  | 30 June 1960. | „ T. D. Muthuswamy.              |
| Assistant Agronomist, Sirugamani.                                | Throughout.   |               | „ K. R. Sundaresan.              |
| <i>Chemistry Section.</i>                                        |               |               |                                  |
| Agricultural Chemist and Associate Professor of Soil science.    | 1 July 1959.  | 11 Oct. 1959. | <i>Vacant.</i>                   |
| Agricultural Bacteriologist.                                     | 12 Oct. 1959. | 30 June 1960. | Sri T. N. Ananthanarayan.        |
|                                                                  | Throughout.   |               | „ K. Sivasankaran Nair.          |
| Assistant Agricultural Chemist (Phosphal).                       | Throughout.   |               | „ C. R. Venkataraman.            |
| Assistant Agricultural Chemist (Groundnut Storage Scheme).       | 1 July 1959.  | 10 Nov. 1959. | „ C. K. Rajagopal.               |
|                                                                  | 11 Nov. 1959. | 30 June 1960. | „ D. M. Samuel.                  |
| Assistant Agricultural Chemist (Blast resistance).               | Throughout.   |               | „ C. P. Natarajan.               |
| Assistant Agricultural Chemist (Leguminous green Manure Scheme). | Do.           |               | „ K. Vasudeva Menon.             |
| Assistant Agricultural Chemist (Alkaline lands).                 | 1 July 1959.  | 16 Dec. 1959. | „ F. L. Daniel.                  |
|                                                                  | 17 Dec. 1959. | 26 Dec. 1959. | „ Senior Assistant (in charge).  |
|                                                                  | 27 Dec. 1959. | 30 June 1960. | „ F. L. Daniel.                  |
| Assistant Agricultural Chemist (Soil Survey).                    | Throughout.   |               | „ T. A. Govinda Iyer.            |
| Soil Survey Officer ..                                           | Do.           |               | „ C. Rathnam.                    |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of post.                                                                | Period.       |                | Name of the Officer-in-charge.    |
|------------------------------------------------------------------------------|---------------|----------------|-----------------------------------|
|                                                                              | From          | To             |                                   |
| (1)                                                                          | (2)           | (3)            | (4)                               |
| <b>RESEARCH SECTION—cont.</b>                                                |               |                |                                   |
| <i>Chemistry Section—cont.</i>                                               |               |                |                                   |
| Assistant Soil Chemist, Soil Testing Lab., Aduthurai (New post.)             | 14 Apr. 1960. | 30 June 1960.  | Sri C. K. Rajagopal.              |
| Assistant Soil Chemist, Soil Testing Lab., Coimbatore, (New post.)           | 6 Apr. 1960.  | 30 June 1960.  | „ Venkatachalam.                  |
| Assistant Agricultural Chemist, Parambikulam Project, Coimbatore (New post.) | 5 Mar. 1960.  | 30 June 1960.  | „ N. M. Thyagarajan.              |
| <i>Entomology Section.</i>                                                   |               |                |                                   |
| Entomologist and Associate Professor of Entomology.                          | 1 July 1959.  | 20 Sept. 1959. | Sri P. S. Narayanaswamy.          |
|                                                                              | 21 Sep. 1959. | 16 May 1960.   | „ Md. Basheer.                    |
|                                                                              | 17 May 1960.  | 30 June 1960.  | „ K. R. Nagaraja Rao.             |
| Assistant Entomologist, Sugarcane insect Research Scheme.                    | 1 July 1959.  | 6 Jan. 1960.   | „ Srimathi A. Leela David.        |
|                                                                              | 7 Jan. 1960.  | 31 Mar. 1960.  | „ S. Venugopal.                   |
|                                                                              | 1 Apr. 1960.  | 1 May 1960.    | „ P. S. Narayanasami.             |
|                                                                              | 2 May 1960.   | 30 June 1960.  | Srimathi A. Leela David.          |
| Agriculturist ..                                                             | 1 July 1959.  | 22 July. 1959. | Sri T. R. Subramanyam.            |
|                                                                              | 23 July 1959. | 20 Sep. 1959.  | „ P. S. Narayanasamy. (in charge) |
|                                                                              | 21 Sep. 1959. | 31 Mar. 1960.  | „ Do.                             |
| (Post abolished with effect from 31st March 1960 after noon).                |               |                |                                   |
| Assistant Entomologist (Toxicology).                                         | 1 July 1959.  | 15 Nov. 1959.  | Srimathi I. P. Janaki.            |
|                                                                              | 16 Nov. 1959. | 6 Mar. 1960.   | Sri K. R. Nagaraja Rao.           |
|                                                                              | 7 Mar. 1960.  | 30 June 1960.  | „ P. S. Muthukrishnan.            |
| Crop and Plant Protection Officer (Entomology), Coimbatore.                  | Throughout    |                | „ K. R. Nagarajan.                |
| Assistant Entomologist (Paddy Stem-borer), Aduthurai.                        | Do.           |                | „ P. R. Nagaraja Rao.             |
| Assistant Entomologist Vegetable Scheme, Coimbatore (New post.)              | 1 Apr. 1960.  | 4 May 1960.    | „ S. Venugopal.                   |
|                                                                              | 5 May 1960.   | 30 June 1960.  | „ K. C. Chandiy.                  |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of post.                                                         | Period.       |               | Name of the officer<br>in-charge.               |
|-----------------------------------------------------------------------|---------------|---------------|-------------------------------------------------|
|                                                                       | From          | To            |                                                 |
| (1)                                                                   | (2)           | (3)           | (4)                                             |
| RESEARCH SECTION—cont.                                                |               |               |                                                 |
| Entomology Section—cont.                                              |               |               |                                                 |
| Crop and Plant Protection Officer (Entomology), Thanjavur (New Post.) | 31 July 1959. | 10 Nov. 1959. | Sri T. R. Subramanyan.                          |
|                                                                       | 11 Nov. 1959. | 6 Jan. 1960.  | „ E. V. Abraham.                                |
|                                                                       | 7 Jan. 1960.  | 6 Mar. 1960.  | „ T. S. Muthukrishnan                           |
|                                                                       | 7 Mar. 1960.  | 30 June 1960. | „ E. V. Abraham.                                |
| Mycology Section.                                                     |               |               |                                                 |
| Mycologist and Associate Professor of Plant Pathology.                | 1 July 1959.  | 31 July 1959. | Vacant.                                         |
|                                                                       | 1 Aug. 1959.  | 30 June 1960. | Sri M. Kandaswamy.                              |
| Assistant Mycologist Paddy Stemrot, Aduthurai.                        |               | Throughout.   | „ C. S. Krishnamurthy.                          |
| Crop and Plant Protection Officer (Mycology) Coimbatore.              |               | Throughout.   | „ N. R. Adyanthayya.                            |
| Crop and Plant Protection Officer, (Mycology) Madurai (New Post.).    | 16 July 1959. | 30 June 1960. | „ T. V. Subramanyam.                            |
| Assistant Mycologist (Algar Scheme) (New Post.).                      | 1 Apr. 1960.  | 4 May 1960.   | „ C. V. Govindaswamy.                           |
|                                                                       | 5 May 1960.   | 30 June 1960. | Srimathi C. K. Sowmini Raj gopalan (in charge). |
| Assistant Mycologist (Vegetable Scheme Coimbatore) (New Post.).       | 11 Apr. 1960. | 30 June 1960. | Sri N. Jaleel Ahmed.                            |
| Research Engineering Section.                                         |               |               |                                                 |
| Research Engineer (New Post.).                                        | 20 May 1960.  | 30 June 1960. | Sri C. S. Sridharan.                            |
| Assistant Agricultural Engineer (Research), Coimbatore.               | 1 July 1959.  | 19 Aug. 1959. | „ A. M. Mohamad Ali.                            |
|                                                                       | 20 Aug. 1959. | 27 Aug. 1959. | Vacant                                          |
|                                                                       | 28 Aug. 1959. | 17 Nov. 1959. | Sri A. M. Mohamad Ali.                          |
|                                                                       | 18 Nov. 1959. | 31 Dec. 1959. | „ K. T. Narayanan (in charge).                  |
|                                                                       | 1 Jan. 1960.  | 30 June 1960. | „ A. M. Mohamad Ali.                            |
| Assistant Agricultural Engineer (Groundnut Scheme).                   | 1 July 1959.  | 21 June 1960. | „ K. T. Narayanan.                              |

(Post abolished with effect from 22 June 1960).

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of post.                                             | Period.       |               | Name of the officer<br>in-charge.  |
|-----------------------------------------------------------|---------------|---------------|------------------------------------|
|                                                           | From          | To            |                                    |
| (1)                                                       | (2)           | (3)           | (4)                                |
| DISTRICTS.                                                |               |               |                                    |
| Madras Division.                                          |               |               |                                    |
| Deputy Director, Madras.                                  | 1 July 1959.  | 23 Aug. 1959. | Sri M. Mukundan.                   |
|                                                           | 24 Aug. 1959. | 28 Aug. 1959. | „ K. Sreeraman (in charge).        |
|                                                           | 29 Aug. 1959. | 29 Sep. 1959. | „ A. Muhamed Ali (in charge).      |
|                                                           | 30 Sep. 1959. | 30 June 1960. | „ M. Mukundan.                     |
| District Agricultural Officer, Vellore.                   |               | Throughout.   | „ A. Radhakrishna Reddy.           |
| District Agricultural Officer, Polur.                     |               | Throughout.   | „ K. S. Kutty Mudaliar             |
| District Agricultural Officer, Guindy.                    |               | Throughout.   | „ N. Ganesamurthy.                 |
| District Agricultural Officer, Chingleput.                | 1 July 1959.  | 24 Apr. 1960. | „ V. Venkatasubramaniam.           |
|                                                           | 25 Apr. 1960. | 30 June 1960. | „ N. Ganesamurthy (in charge).     |
| District Agricultural Officer, Cuddalore.                 | 1 July 1959.  | 7 Dec. 1959.  | „ M. K. Lingiah.                   |
|                                                           | 8 Dec. 1959.  | 17 Dec. 1959. | „ M. S. Kolandaiswamy (in charge). |
|                                                           | 18 Dec. 1959. | 5 Apr. 1960.  | „ M. K. Lingiah.                   |
|                                                           | 6 Apr. 1960.  | 30 June 1960. | „ S. Annaswamy.                    |
| District Agricultural Officer, Villupuram.                | 1 July 1959.  | 19 July 1959. | „ M. K. Lingiah (in charge).       |
|                                                           | 20 July 1959. | 31 July 1959. | „ E. G. Sivaswamy.                 |
|                                                           | 1 Aug. 1959.  | 6 Aug. 1959.  | „ M. K. Lingiah (in charge).       |
|                                                           | 7 Aug. 1959.  | 30 June 1960. | „ M. S. Kolandaiswamy.             |
| Superintendent, Agricultural Research Station Tirurkupam. | 1 July 1959.  | 11 July 1959. | „ V. Krishnaswamy.                 |
|                                                           | 12 July 1959. | 31 July 1959. | „ S. T. Srinivasan. (in charge).   |
|                                                           | 1 Aug. 1959.  | 30 June 1960. | „ K. Thandavarayan.                |
| Seed Development Officer, Madras.                         | 1 July 1959.  | 25 Oct. 1959. | „ K. Sriraman.                     |
|                                                           | 26 Oct. 1959. | 19 Nov. 1959. | „ M. Mukundan (in charge).         |
|                                                           | 20 Nov. 1959. | 29 Feb. 1960. | „ K. Sriraman.                     |
|                                                           | 1 Mar. 1960.  | 12 Mar. 1960. | „ M. Mukundan (in charge).         |
|                                                           | 13 Mar. 1960. | 23 June 1960. | „ Herbert Audiseshiah.             |
|                                                           | 24 June 1960. | 30 June 1960. | „ V. Venkatasubramanyam.           |
| Superintendent, Agricultural Research Station, Palur.     |               | Throughout.   | „ M. K. Venkatasubramanian.        |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of post.                                                       | Period.       |               | Name of the Officer in-charge.       |
|---------------------------------------------------------------------|---------------|---------------|--------------------------------------|
|                                                                     | From          | To            |                                      |
| (1)                                                                 | (2)           | (3)           | (4)                                  |
| DISTRICTS—cont.                                                     |               |               |                                      |
| Madras Division—cont.                                               |               |               |                                      |
| Superintendent, Agricultural Research Station, Tindivanam.          | Throughout.   |               | Sri P. Krishnaswamy.                 |
| Assistant Agricultural Engineer (Soil Conservation Scheme, Vellore. | Throughout.   |               | „ K. Viswanathan.                    |
| Assistant Agricultural Engineer (Soil Conservation Scheme) Panruti. | Throughout.   |               | „ S. Savadimuthu.                    |
| Assistant Agricultural Engineer Cuddalore (New Post).               | 20 July 1959. | 8 Oct. 1959.  | „ S. Subramanyam.                    |
|                                                                     | 9 Oct. 1959.  | 7 Dec. 1959.  | „ M. K. Lingiah, (in-charge)         |
|                                                                     | 8 Dec. 1959.  | 17 Dec. 1959. | „ M. Kolandaiswamy.                  |
|                                                                     | 18 Dec. 1959. | 3 Feb. 1960.  | „ M. K. Lingiah, (in charge)         |
|                                                                     | 4 Feb. 1960.  | 30 June 1960  | „ P. G. Gopalan (in charge).         |
| Assistant Director (Drilling), Chidambaram.                         | 1 July 1959.  | 16 May 1960.  | „ K. Natarajan.                      |
|                                                                     | 16 May. 1960. | 30 June 1960. | „ J. Krishnamurthy.                  |
| Thanjavur Division.                                                 |               |               |                                      |
| Deputy Director, Thanjavur.                                         | 1 July 1959.  | 31 July 1959. | Sri B. Santhanakrishnan.             |
|                                                                     | 1 Aug. 1959.  | 4 Nov. 1959.  | „ K. Santhanam.                      |
|                                                                     | 5 Nov. 1959.  | 15 Dec. 1959. | „ U. B. Mohamed Abbas (in charge).   |
|                                                                     | 16 Dec. 1959. | 30 June 1960. | „ K. Santhanam.                      |
| District Agricultural Officer, Thanjavur.                           | 1 July 1959.  | 22 July 1959. | „ P. N. Muthuswamy.                  |
|                                                                     | 23 July 1959. | 30 June 1960. | „ T. P. Shanmuga Nainar.             |
| District Agricultural Officer, Kumbakonam.                          | 1 July 1959.  | 4 Aug. 1959.  | Sri K. N. Duraiswamy.                |
|                                                                     | 5 Aug. 1959.  | 23 Mar. 1960. | „ R. Shanmugasundaram. (in charge)   |
|                                                                     | 24 Mar. 1960. | 30 June 1960. | „ R. Viswanathan.                    |
| District Agricultural Officer, Pattukottai.                         | Throughout.   |               | „ R. Shanmugasundaram.               |
| District Agricultural Officer, Mayuram.                             | 1 July 1959.  | 6 Sep. 1959.  | „ M. Kalimuthu.                      |
|                                                                     | 7 Sep. 1959.  | 16 Sep. 1959. | „ T. P. Shanmuga Nainar (in charge). |
|                                                                     | 17 Sep. 1959. | 20 Oct. 1959. | „ M. Kalimuthu.                      |
|                                                                     | 21 Oct. 1959. | 26 Oct. 1959. | „ T. P. Shanmuga Nainar.             |
|                                                                     | 27 Oct. 1959. | 30 June 1960. | „ M. Kalimuthu.                      |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                                                | Period.       |               | Name of the Officer in charge     |
|--------------------------------------------------------------------------------------------------|---------------|---------------|-----------------------------------|
|                                                                                                  | From          | To            |                                   |
| (1)                                                                                              | (2)           | (3)           | (4)                               |
| DISTRICTS—cont.                                                                                  |               |               |                                   |
| Thanjavur Division—cont.                                                                         |               |               |                                   |
| District Agricultural Officer, Tiruchirappalli (North).                                          | 1 July 1959.  | 12 Aug. 1959. | Sri K. Kuppanuthu.                |
|                                                                                                  | 13 Aug. 1959. | 30 June 1960. | „ G. Murugesan.                   |
| District Agricultural Officer, Tiruchirappalli (South).                                          | 1 July 1959.  | 30 July 1959. | „ K. Kuppanuthu. (in charge).     |
|                                                                                                  | 31 July 1959. | 30 June 1960. | „ P. N. Muthuswamy.               |
| Seed Development Officer, Thanjavur.                                                             | 1 July 1959.  | 2 Oct. 1959.  | „ K. M. Sundaram.                 |
|                                                                                                  | 3 Oct. 1959.  | 17 Feb. 1960. | „ K. Santhanam (in charge).       |
|                                                                                                  | 18 Feb. 1960. | 30 June 1960. | „ P. S. Ananthachari.             |
| Superintendent, Agricultural Research Station, Aduthurai.                                        | Throughout.   |               | „ V. Srinivasan.                  |
| Superintendent Agricultural Research Station, Pattukottai.                                       | Throughout.   |               | „ R. H. Krishnan.                 |
| Assistant Agricultural Engineer (Inspection), Tiruchirappalli.                                   | 1 July 1959.  | 8 Oct. 1959.  | „ S. Raju.                        |
|                                                                                                  | 9 Oct. 1959.  | 30 June 1960. | „ S. Subramaniam.                 |
| Joint Director of Agriculture (Package Programme) (New Post) Thanjavur.                          | 15 June 1960. | 30 June 1960. | „ T. S. Francis.                  |
| Assistant Agricultural Engineer (Soil Conservation Scheme), Manapparai, formerly at Kodaikanal). | 7 Apr. 1960.  | 30 June 1960. | „ T. R. Narasimhalu.              |
| Madurai Division.                                                                                |               |               |                                   |
| Deputy Director, Madurai.                                                                        | 1 July 1959.  | 8 June 1960.  | Sri U. B. Muhammed Abbas.         |
|                                                                                                  | 9 Jun. 1960.  | 30 June 1960. | „ K. Santhanam (in charge).       |
| District Agricultural Officer, Madurai.                                                          | Throughout.   |               | „ R. Subbiah Pillai               |
| District Agricultural Officer, Dindigul.                                                         | 1 July 1959.  | 7 Dec. 1959.  | „ B. P. Masilamani.               |
|                                                                                                  | 8 Dec. 1959.  | 10 Feb. 1960. | „ R. Subbiah Pillai. (in charge). |
|                                                                                                  | 11 Feb. 1960. | 30 June 1960. | „ B. P. Masilamani                |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.<br>(1)                                                          | Period.       |                                                                                         | Name of the<br>Officer in charge.<br>(4) |
|-----------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------|------------------------------------------|
|                                                                                   | From<br>(2)   | To<br>(3)                                                                               |                                          |
| Districts—cont.<br>Madurai Division—cont.                                         |               |                                                                                         |                                          |
| District Agricultural<br>Officer, Sattur.                                         | 1 July 1959.  | 1 Aug. 1959.                                                                            | Sri R. Krishnamurthy.                    |
|                                                                                   | 2 Aug. 1959.  | 13 Aug. 1959.                                                                           | „ R. Subbiah Pillai,<br>(in charge).     |
|                                                                                   | 14 Aug. 1959. | 30 June 1960.                                                                           | „ P. K. Sivasubramaniam.                 |
| District Agricultural<br>Officer, Sivaganga.                                      | 1 July 1959.  | 7 Feb. 1960.                                                                            | „ R. Kolasivelu<br>Naicker.              |
|                                                                                   | 8 Feb. 1960.  | 16 Feb. 1960.                                                                           | „ P. K. Sivasubramaniam<br>(in charge).  |
|                                                                                   | 17 Feb. 1960. | 30 June 1960.                                                                           | „ M. N. Mooneswami-<br>sundaram.         |
| District Agricultural<br>Officer, Tirunelveli.                                    | 1 July 1959.  | 30 Jan. 1960.                                                                           | „ A. Venkataraman.                       |
|                                                                                   | 31 Jan. 1960. | 22 Feb. 1960.                                                                           | „ E. G. Sivaswami<br>(in charge).        |
|                                                                                   | 23 Feb. 1960. | 8 Apr. 1960.                                                                            | „ A. Venkataraman                        |
|                                                                                   | 9 Apr. 1960.  | 30 June 1960.                                                                           | „ S. Ramachandran.                       |
| District Agricultural<br>Officer, Sankarankoil.                                   | 1 July 1959.  | 5 Aug. 1959.                                                                            | „ M. Edwin Amirtharej.                   |
|                                                                                   | 6 Aug. 1959.  | 22 Dec. 1959.                                                                           | „ A. Venkataraman<br>(in charge).        |
|                                                                                   | 22 Dec. 1959. | 30 June 1960.                                                                           | „ E. G. Sivaswami.                       |
| District Agricultural<br>Officer, Nagercoil.                                      | Throughout.   |                                                                                         | „ K. M. Narayanan.                       |
| Assistant Agronomist<br>Research in Block<br>Soil Region Kollipatti (New Post).   | 15 Apr. 1960. | 30 June 1960.                                                                           | „ M. S. Sethuraman.                      |
| Superintendent, Agri-<br>cultural Research<br>Station, Kollipatti.                | 1 July 1959.  | 14 Oct. 1959.                                                                           | „ G. Ramabadrar.                         |
|                                                                                   | 15 Oct. 1959. | 30 June 1960.                                                                           | „ K. Diwakaran<br>(in charge).           |
| Seed Development<br>Officer, Madurai.                                             | 1 July 1959.  | 3 Nov. 1959.                                                                            | „ S. Ramachandran.                       |
|                                                                                   | 4 Nov. 1959.  | 3 Dec. 1959.                                                                            | „ U. B. Mohamed Abbas<br>(in charge.)    |
|                                                                                   | 4 Dec. 1959.  | 31 Mar. 1960.                                                                           | „ S. Ramachandran.                       |
|                                                                                   | 1 Apr. 1960.  | 30 June 1960.                                                                           | „ K. O. Thomas.                          |
| Assistant Agricultural<br>Engineer (Ins-<br>pection), Madurai.                    | Throughout.   |                                                                                         | „ P. A. Murthy                           |
| Assistant Agricultural<br>Engineer (Soil Con-<br>servation Scheme)<br>Kodaikanal. | 1 July 1959.  | 31 Mar. 1960.<br>(Head-quarters shifted to Manapparai)<br>District from 1st April 1960. | „ T. R. Narasimham.<br>Tiruchirappalli   |

## APPENDIX No. 72—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                                                       | Period.       |                                                           | Name of the Officer in charge.           |
|---------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------|------------------------------------------|
|                                                                                                         | From          | To                                                        |                                          |
| (1)                                                                                                     | (2)           | (3)                                                       | (4)                                      |
| DISTRICTS—cont.                                                                                         |               |                                                           |                                          |
| Madurai Division—cont.                                                                                  |               |                                                           |                                          |
| Assistant Agricultural Engineer (Soil Conservation Scheme), Dindigul.                                   | Throughout.   |                                                           | Sri T. Sivasubramaniam.                  |
| Assistant Agricultural Engineer (Soil Conservation Scheme) Dry Farming Scheme, Battagundu (New scheme). | 7 June 1960.  | 30 June 1960.                                             | „ S. C. Nallagowder.                     |
| Assistant Agricultural Engineer Tirunelveli (Newly started).                                            | 23 July 1959. | 30 June 1960.                                             | „ K. Lingannan.                          |
| Special District Agricultural Officer (Crop Sampling), Madurai.                                         | 1 July 1959.  | 31 Mar. 1960.<br>(Post abolished with effect after-noon). | „ K. C. Thomas.<br>from 31st March, 1960 |
| Coimbatore Division.                                                                                    |               |                                                           |                                          |
| Deputy Director of Agriculture, Coimbatore.                                                             | 1 July 1959.  | 3 Aug. 1959.                                              | Sri A. H. Subramania Sarma.              |
|                                                                                                         | 4 Aug. 1959.  | 14 Dec. 1959.                                             | „ E. G. Sivaswamy.                       |
|                                                                                                         | 15 Dec. 1959. | 30 June 1960.                                             | „ P. P. Syed Mohamud.                    |
| Seed Development Officer, Coimbatore.                                                                   | 1 July 1959.  | 12 Feb. 1960.                                             | „ T. S. Dakshinamurthy.                  |
|                                                                                                         | 13 Feb. 1960. | 24 Feb. 1960.                                             | „ P. P. Syed Mohamud,<br>(in charge).    |
|                                                                                                         | 25 Feb. 1960. | 22 Apr. 1960.                                             | „ T. S. Dakshinamurthy.                  |
|                                                                                                         | 23 Apr. 1960. | 17 May 1960.                                              | „ P. P. Syed Mohamud<br>(in charge).     |
|                                                                                                         | 18 May 1960.  | 30 June 1960.                                             | „ T. S. Dakshinamurthy.                  |
| District Agricultural Officer, Coimbatore.                                                              | 1 July 1959.  | 17 May 1960.                                              | „ K. H. Subramania Iyer.                 |
|                                                                                                         | 18 May 1960.  | 6 June 1960.                                              | „ T. Arunachalam<br>(in charge).         |
|                                                                                                         | 7 June 1960.  | 30 June 1960.                                             | „ K. H. Subramania Iyer.                 |
| District Agricultural Officer, Erode.                                                                   | Throughout.   |                                                           | „ T. Arunachalam.                        |
| District Agricultural Officer, Salem.                                                                   | Throughout.   |                                                           | „ R. Ramanathan.                         |
| District Agricultural Officer, Krishnagiri.                                                             | Throughout.   |                                                           | „ G. Venkatakrishnan.                    |
| District Agricultural Officer, Ootacamund.                                                              | 1 July 1959.  | 3 July 1959.                                              | „ B. Srinivasa Rao.                      |
|                                                                                                         | 4 July 1959.  | 28 July 1959.                                             | „ K. H. Subramania Iyer (in charge).     |
|                                                                                                         | 29 July 1959. | 17 Feb. 1960.                                             | „ B. Srinivasa Rao.                      |
|                                                                                                         | 18 Feb. 1960. | 30 June 1960.                                             | „ K. Hanumantha Rao.                     |



## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                | Period.                                              |               | Name of the officer<br>(in charge).  |
|------------------------------------------------------------------|------------------------------------------------------|---------------|--------------------------------------|
|                                                                  | From                                                 | To            |                                      |
| (1)                                                              | (2)                                                  | (3)           | (4)                                  |
| Districts—cont.                                                  |                                                      |               |                                      |
| Coimbatore Division—cont.                                        |                                                      |               |                                      |
| Superintendent, Agricultural Research Station, Nanjanad.         | Throughout.                                          |               | Sri K. Radhakrishna Alwa.            |
| Superintendent, Agricultural Research Station, Bhavanisagar.     | 1 July 1959.                                         | 1 Nov. 1959.  | „ S. Satharishi.                     |
|                                                                  | 2 Nov. 1959.                                         | 10 Jan. 1960. | „ S. T. Srinivasan.                  |
|                                                                  | 11 Jan. 1960.                                        | 30 June 1960. | „ K. Satharishi.                     |
| Curator, Ootacamund.                                             | 1 July 1959.                                         | 30 June 1960. | „ B. G. Narayana Menon.              |
| Assistant Agricultural Engineer (Inspection), Coimbatore.        | Throughout.                                          |               | „ K. Thandayutham.                   |
| Assistant Agricultural Engineer (Soil Conservation), Coimbatore. | Throughout.                                          |               | „ Leo Swamikan.                      |
| Assistant Agricultural Engineer (Soil Conservation), Ootacamund. | 1 July 1959.                                         | 9 Aug. 1959.  | „ C. R. Shanmugam.                   |
|                                                                  | 10 Aug. 1959.                                        | 2 Sep. 1959.  | „ K. P. Sanjeeva Shetty (in charge). |
|                                                                  | 3 Sep. 1959.                                         | 2 Oct. 1959.  | „ C. R. Shanmugam.                   |
|                                                                  | 3 Oct. 1959.                                         | 14 Oct. 1959. | „ K. P. Sanjeeva Shetty (in charge). |
|                                                                  | 15 Oct. 1959.                                        | 30 June 1960. | „ S. Raju.                           |
| Assistant Agricultural Engineer (Soil Conservation), Coonoor.    | 1 July 1959.                                         | 19 July 1959. | „ C. R. Shanmugam (in charge).       |
|                                                                  | 20 July 1959.                                        | 9 Nov. 1959.  | „ K. P. Sanjeeva Shetty.             |
|                                                                  | 10 Nov. 1959.                                        | 26 Nov. 1959. | „ S. Raju (in charge).               |
|                                                                  | 27 Nov. 1959.                                        | 30 June 1960. | „ K. P. Sanjeeva Shetty.             |
| Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.  | 1 July 1959.                                         | 6 May 1960.   | „ K. Gopalakrishnan.                 |
|                                                                  | 7 May 1960.                                          | 19 May 1960.  | „ A. M. Mohamed Ali (in charge).     |
|                                                                  | 20 May 1960.                                         | 30 June 1960. | „ K. Gopalakrishnan.                 |
| Assistant Director (Drilling), Coimbatore.                       | 1 July 1959.                                         | 31 Mar. 1960. | „ K. Srinivasan.                     |
|                                                                  | 1 Apr. 1960.                                         | 5 Apr. 1960.  | Vacant.                              |
|                                                                  | (Head-quarters shifted to Salem from 6th April 1960. |               |                                      |

## APPENDIX No. 27—cont.

*Appointments, postings and transfers of Gazetted Officers from  
1st July 1959 to 30th June 1960—cont.*

| Name of the post.                                                                                    | Period.       |               | Name of the in charge.     |
|------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------|
|                                                                                                      | From          | To            |                            |
| (1)                                                                                                  | (2)           | (3)           | (4)                        |
| Districts—cont.                                                                                      |               |               |                            |
| Coimbatore Division—cont.                                                                            |               |               |                            |
| Assistant Director (Drilling), Salem.                                                                | 6 Apr. 1960.  | 30 June 1960. | Sri K. Srinivasan.         |
| Assistant Agricultural Engineer (Soil Conservation), Dry Farming Scheme, Palladam (New post).        | 21 Mar. 1960. | 30 June 1960. | „ A. N. Ramalingam.        |
| Assistant Agricultural Engineer (Soil Conservation), Salem (New post).                               | 9 June 1960.  | 30 June 1960. | „ S. Ramiah.               |
| Assistant Agricultural Engineer (Soil Conservation), Sub- Assistant Training, Coimbatore (New post). | 4 Dec. 1959.  | 30 June 1960. | „ K. R. Thiruvengadaswamy. |

*Officers who were on leave during the period under report.*

| Name of the officer.               | Period        |               |
|------------------------------------|---------------|---------------|
|                                    | From          | To            |
| Sri A. Abdul Samad .. .. .         | 1 Mar. 1960.  | 31 Mar. 1960. |
| „ V. K. Appaji .. .. .             | 2 June 1960.  | 7 Aug. 1960.  |
| „ S. G. Ayyadurai .. .. .          | 1 July 1959.  | 31 Aug. 1959. |
| „ C. Balasubramaniam .. .. .       | 26 Nov. 1959. | 10 Dec. 1959. |
| „ T. S. Francis .. .. .            | 29 Jan. 1960. | 12 Feb. 1960. |
| „ S. Kanakaraj David .. .. .       | 1 Mar. 1960.  | 13 Mar. 1960. |
|                                    | 3 May 1960.   | 12 May 1960.  |
| „ K. M. Krishna Menon .. .. .      | 15 May 1959.  | 2 Aug. 1959.  |
| „ S. M. Sulaiman .. .. .           | 8 Nov. 1959.  | 6 Apr. 1960.  |
| „ P. S. Narayanaswamy .. .. .      | 2 May 1960.   | 5 July 1960.  |
| „ T. S. Palanivelu .. .. .         | 17 Aug. 1959. | 30 Sep. 1959. |
| „ S. Ramaswamy .. .. .             | 22 Jan. 1959. | 4 July 1959.  |
| „ P. N. Krishnaswamy Rao .. .. .   | 16 June 1959. | 15 Oct. 1959. |
| „ K. Santhanam .. .. .             | 20 Apr. 1959. | 23 July 1959. |
| „ N. Sankaranarayana Reddy .. .. . | 22 June 1960. | 10 July 1960. |
| „ E. G. Sivaswamy .. .. .          | 7 May 1959.   | 12 July 1959. |

## APPENDIX No. 27—cont.

Officers who were on leave during the period under report—cont.

| Name of the officer.                  | Period        |               |
|---------------------------------------|---------------|---------------|
|                                       | From          | To            |
| Sri K. H. Subramanya Sarma .. ..      | 19 Oct. 1959. | 29 Oct. 1959. |
| „ P. P. Syed Muhammed .. ..           | 7 Aug. 1959.  | 6 Dec. 1959.  |
| „ F. L. Daniel .. ..                  | 17 Dec. 1959. | 26 Dec. 1959. |
| „ K. Narayanan Nayar .. ..            | 2 Aug. 1959.  | 1 Oct. 1959.  |
| „ J. H. S. Ponnayya .. ..             | 22 Feb. 1960. | 3 Apr. 1960.  |
| „ K. Satharishi .. ..                 | 2 Nov. 1959.  | 10 Jan. 1960. |
| „ C. V. Govindaswamy .. ..            | 5 May 1960.   | 2 Aug. 1960.  |
| „ K. P. Sanjseva Shetty .. ..         | 10 Nov. 1959. | 28 Nov. 1959. |
| „ A. Subramaniam .. ..                | 20 Mar. 1959. | 14 July 1959. |
| Dr. A. Mariukulandai .. ..            | 13 May 1959.  | 13 Aug. 1959. |
| Sri B. P. Masilamani .. ..            | 8 Dec. 1959.  | 10 Feb. 1960. |
| „ S. Gonsalves .. ..                  | 17 Aug. 1959. | 31 Aug. 1959. |
| „ .. ..                               | 30 Dec. 1959. | 31 Dec. 1959. |
| „ .. ..                               | 5 June 1960.  | 4 July 1960.  |
| „ A. M. Muhamud Ali .. ..             | 20 Aug. 1959. | 27 Aug. 1959. |
| „ V. N. Mathava Rao .. ..             | 4 Sep. 1959.  | 30 Sep. 1959. |
| Dr. V. Santhana .. ..                 | 23 Sep. 1959. | 4 Oct. 1959.  |
| Sri K. Sriraman .. ..                 | 26 Oct. 1959. | 19 Nov. 1959. |
| „ V. G. Venkataramana Rao .. ..       | 15 Sep. 1959. | 30 Sep. 1959. |
| „ .. ..                               | 17 May 1960.  | 31 May 1960.  |
| „ S. Varadarajan .. ..                | 1 May 1960.   | 14 June 1960. |
| „ K. Thandavarayan .. ..              | 25 Apr. 1959. | 25 July 1959. |
| Srimathi Girija Balasubramanyam .. .. | 1 May 1960.   | 31 May 1960.  |
| Sri K. Kuppamuthu .. ..               | 15 Apr. 1960. | 18 Aug. 1960. |
| „ S. Muthuswamy .. ..                 | 6 May 1960.   | 24 July 1960. |
| „ T. P. Shanmuga Nayanar .. ..        | 6 June 1959.  | 22 July 1959. |
| „ T. S. Dakshinamurthy .. ..          | 13 Feb. 1960. | 24 Feb. 1960. |
| „ .. ..                               | 23 Apr. 1960. | 17 May 1960.  |
| „ K. R. Raman .. ..                   | 2 July 1959.  | 25 July 1959. |
| „ T. B. Krishnasamy Rao .. ..         | 31 Aug. 1959. | 20 Sep. 1959. |
| „ M. Kalimuthu .. ..                  | 7 Sep. 1959.  | 16 Sep. 1959. |
| „ .. ..                               | 21 Oct. 1959. | 26 Oct. 1959. |
| „ S. Ramachandran .. ..               | 4 Nov. 1959.  | 3 Dec. 1959.  |
| „ M. Damodara Prabhu .. ..            | 12 May 1960.  | 12 June 1960. |
| „ P. Chandrasekaran .. ..             | 25 June 1960. | 9 July 1960.  |
| „ K. Gopalakrishnan .. ..             | 7 May 1960.   | 19 May 1960.  |
| „ V. Venkatasubramanian .. ..         | 25 Apr. 1960. | 24 June 1960. |
| „ M. K. Lingiah .. ..                 | 1 June 1960.  | 15 June 1960. |
| „ C. R. Seshadri .. ..                | 7 Apr. 1960.  | 16 May 1960.  |
| „ Md. Basheer .. ..                   | 23 July 1959. | 20 Sep. 1959. |
| „ .. ..                               | 17 May 1960.  | 12 Aug. 1960. |
| „ S. Savadamuthu .. ..                | 3 June 1960.  | 19 June 1960. |
| „ S. T. Srinivasan .. ..              | 23 Feb. 1960. | 18 Mar. 1960. |

## APPENDIX No. 28.

Strength of staff of the Agricultural Department as on 1st July 1960 (gazetted posts).

| Serial number,<br>Service, Class<br>and Category.                                                                            | Designation of the post.                                        | Posts as on 1st July 1960. |                 |        |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------|-----------------|--------|
|                                                                                                                              |                                                                 | Perma-<br>nent.            | Tempo-<br>rary. | Total. |
| (1)                                                                                                                          | (2)                                                             | (3)                        | (4)             | (5)    |
| GAZETTED POSTS.                                                                                                              |                                                                 |                            |                 |        |
| I. Indian Administrative Service—                                                                                            |                                                                 |                            |                 |        |
| 1 I.A.S.                                                                                                                     | Director of Agriculture ..                                      | 1                          | ..              | 1      |
| II. Madras Agricultural Service—                                                                                             |                                                                 |                            |                 |        |
| 1                                                                                                                            | .. Dean and Additional Director of Agriculture.                 | ..                         | 1               | 1      |
| 2 Category 1                                                                                                                 | .. Joint Director of Agriculture ..                             | 2                          | 4               | 6      |
| 3 Do.                                                                                                                        | .. Principal, now redesignated as Associate Dean.               | 1                          | ..              | 1      |
| 4 Do.                                                                                                                        | .. Headquarters Deputy Director. (Engineering).                 | 1                          | ..              | 1      |
| (NOTE.—The post of the headquarter Deputy Director is no more in existence having been downgraded as Agricultural Engineer). |                                                                 |                            |                 |        |
| 5 Category 2                                                                                                                 | .. Deputy Director of Agriculture.                              | 3                          | 1               | 4      |
| 6 Do.                                                                                                                        | .. Oilseeds Development Officer ..                              | ..                         | 1               | 1      |
| 7 Do.                                                                                                                        | .. State Marketing Officer ..                                   | 1                          | ..              | 1      |
| 8 Do.                                                                                                                        | .. Agronomist and Professor of Agronomy.                        | 1                          | ..              | 1      |
| 9 Do.                                                                                                                        | .. Compost Development Officer ..                               | ..                         | 1               | 1      |
| 10 Do.                                                                                                                       | .. Extension Specialist ..                                      | ..                         | 1               | 1      |
| 11 Do.                                                                                                                       | .. Research Engineer ..                                         | ..                         | 1               | 1      |
| 12 Do.                                                                                                                       | .. General Superintendent ..                                    | 1                          | ..              | 1      |
| 13 Do.                                                                                                                       | .. Professor in Agricultural Engineering.                       | ..                         | 1               | 1      |
| 14 Category 3                                                                                                                | .. Cotton Extension Officer ..                                  | ..                         | 1               | 1      |
| 15 Do.                                                                                                                       | .. Sugarcane Specialist, Cuddalore.                             | ..                         | 1               | 1      |
| 16 Do.                                                                                                                       | .. Horticulturist ..                                            | 1                          | 1               | 2      |
| 17 Do.                                                                                                                       | .. Tobacco Development Officer ..                               | ..                         | 1               | 1      |
| 18 Do.                                                                                                                       | .. Crop Specialists ..                                          | 4                          | ..              | 4      |
| 19 Do.                                                                                                                       | .. Agricultural Chemist and Associate Professor of Soil Science | 1                          | ..              | 1      |
| 20 Do.                                                                                                                       | .. Entomologist and Associate Professor of Entomology.          | 1                          | ..              | 1      |
| 21 Do.                                                                                                                       | .. Mycologist and Associate Professor of Plant Pathology.       | 1                          | ..              | 1      |
| 22 Do.                                                                                                                       | .. Systematic Botanist and Associate Professor of Botany.       | 1                          | ..              | 1      |
| 23 Category 4                                                                                                                | .. District Agricultural Officers ..                            | 13                         | 30              | 43     |
| 24 Do.                                                                                                                       | .. Assistant Marketing Officers ..                              | 3                          | 5               | 8      |
| 25 Do.                                                                                                                       | .. Superintendent, Central Farm.                                | 1                          | ..              | 1      |
| 26 Do.                                                                                                                       | .. Lecturer in Agriculture ..                                   | 1                          | 1               | 2      |
| 27 Category 6                                                                                                                | .. Assistant Entomologist ..                                    | 2                          | 5               | 7      |

## APPENDIX No. 28—cont.

Strength of staff of the Agricultural Department as on  
1st July 1960 (Gazetted Posts)—cont.

| Serial number,<br>Service, Class<br>and Category. | Designation of the post.                                                                                                                               | Posts as on 1st July 1960. |                 |        |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------|--------|
|                                                   |                                                                                                                                                        | Perma-<br>nent.            | Tempo-<br>rary. | Total. |
| (1)                                               | (2)                                                                                                                                                    | (3)                        | (4)             | (5)    |
| GAZETTED POSTS —cont.                             |                                                                                                                                                        |                            |                 |        |
| II. Madras Agricultural Service—cont.             |                                                                                                                                                        |                            |                 |        |
| 28 Category 6 ..                                  | Assistant Mycologist including Lecturers.                                                                                                              | 1                          | 5               | 6      |
| 29 Do. ..                                         | Crop and Plant Protection Officers (Entomology) ..                                                                                                     | ..                         | 2               | 2      |
|                                                   | (Mycology) .. ..                                                                                                                                       | ..                         | 2               | 2      |
| 30 Do. ..                                         | Assistant Agricultural Chemist and Lecturers.                                                                                                          | 4                          | 13              | 17     |
| 31 Do. ..                                         | Banana Research Officer, Aduthurai.                                                                                                                    | ..                         | 1               | 1      |
| 32 Do. ..                                         | Cashew Development Officer ..                                                                                                                          | ..                         | 1               | 1      |
| 33 Do. ..                                         | Assistant Horticulturist including Lecturers.                                                                                                          | 1                          | 6               | 7      |
| 34 Do. ..                                         | Lecturer in Economics .. ..                                                                                                                            | 1                          | 1               | 2      |
| 35 Do. ..                                         | Assistant Botanist and Lecturers.                                                                                                                      | 1                          | 1               | 2      |
| 36 Do. ..                                         | Fodder Research Officer ..                                                                                                                             | ..                         | 1               | 1      |
| 37 Do. ..                                         | Cytogeneticist . . . . .                                                                                                                               | 1                          | 1               | 2      |
| 38 Do. ..                                         | Plant Physiologist .. ..                                                                                                                               | 1                          | 2               | 3      |
| 39 Do. ..                                         | Assistant Agronomists ..                                                                                                                               | ..                         | 7               | 7      |
| 40 Do. ..                                         | Superintendent, Agricultural Research Station.                                                                                                         | 6                          | 2               | 8      |
| 41 Do. ..                                         | Assistant Crop Specialists including Cotton Certification Officers.                                                                                    | ..                         | 21              | 21     |
| 42 Do. ..                                         | Assistant Cotton Extension Officer.                                                                                                                    | ..                         | 2               | 2      |
| 43 Do. ..                                         | Coconut Development Officer ..                                                                                                                         | ..                         | 1               | 1      |
| 44 Do. ..                                         | Algologist .. .. .                                                                                                                                     | ..                         | 1               | 1      |
| 45 Do. ..                                         | Agricultural Meteorologist ..                                                                                                                          | 1                          | ..              | 1      |
| 46 Category 7 ..                                  | Assistant Agricultural Engineer (Research).                                                                                                            | 1                          | ..              | 1      |
| 47 Category 8 ..                                  | Assistant Agricultural Engineer (Civil).                                                                                                               | 1                          | ..              | 1      |
| 48 Do. ..                                         | Assistant Agricultural Engineer (Mech) including Stock Verification Officers, Assistant Directors Assistant Agricultural Engineer (Soil Conservation). | 2                          | 22              | 24     |
| 49 Do. ..                                         | Assistant Agricultural Engineer (Tractor Workshop).                                                                                                    | ..                         | 1               | 1      |
| 50 ..                                             | Deputy Director (Drilling) ..                                                                                                                          | ..                         | 1               | 1      |

(NOTE.—Post transferred from the Industries Department with pumping and boring section on 1-4-58. Post not yet classified in the Madras Agricultural Service).

## APPENDIX No. 28—cont.

Strength of staff of the Agricultural Department as on  
1st July 1960 (gazetted posts)—cont.

| Serial number,<br>Service, Class<br>and Category. | Designation of the post.                                          | Posts as on 1st July 1960. |                 |        |
|---------------------------------------------------|-------------------------------------------------------------------|----------------------------|-----------------|--------|
|                                                   |                                                                   | Perma-<br>nent.            | Tempo-<br>rary. | Total. |
| (1)                                               | (2)                                                               | (3)                        | (4)             | (5)    |
| GAZETTED POSTS—cont.                              |                                                                   |                            |                 |        |
| II. Madras Agriculture Services—cont.             |                                                                   |                            |                 |        |
| 51                                                | .. Professors in the Post Graduate Research Institute Coimbatore. | ..                         | 5               | 5      |
| 52                                                | .. Readers in the Post Graduate Research Institute, Coimbatore.   | ..                         | 4               | 4      |
| 53                                                | Madras General Service. Junior Accounts Officer ..                | ..                         | 3               | 3      |
| 54                                                | .. Administrative Officers .. ..                                  | ..                         | 2               | 2      |
| 55                                                | .. Personal Assistant to the Director of Agriculture.             | 1                          | ..              | 1      |
| 56                                                | .. Accounts Officer .. ..                                         | 1                          | ..              | 1      |
| Total ..                                          |                                                                   | 63                         | 163             | 226    |

## APPENDIX No. 29.

## UPPER SUBORDINATES.

## A. RESEARCH SECTION.

Abstract of permanent and temporary posts as on 30th June 1960.

| Serial number and name of the post.<br>(1) | Permanent.<br>(2) | Temporary.<br>(3) | Total.<br>(4) |
|--------------------------------------------|-------------------|-------------------|---------------|
| 1 Chemistry Assistant .. ..                | 16                | 32                | 48            |
| 2 Entomology Assistant .. ..               | 11                | 5                 | 16            |
| 3 Mycology Assistant .. ..                 | 7                 | 8                 | 15            |
| 4 Paddy Assistant .. ..                    | 20                | 13                | 33            |
| 5 Oilseed Assistant .. ..                  | 6                 | 22                | 28            |
| 6 Sugarcane Assistant .. ..                | 2                 | 9                 | 11            |
| 7 Millet and Pulses Assistant .. ..        | 13                | 3                 | 16            |
| 8 Botany Assistant .. ..                   | 5                 | 9                 | 14            |
| 9 Cotton Assistant .. ..                   | 10                | 17                | 27            |
| 10 Cytogenetics .. ..                      | 1                 | ..                | 1             |
| 11 Statistical Assistant .. ..             | ..                | 2                 | 2             |
| 12 Horticultural Assistant .. ..           | 6                 | 16                | 22            |
| 13 Plant Physiology .. ..                  | 1                 | ..                | 1             |
| 14 Potato .. ..                            | 3                 | ..                | 3             |
| 15 Curator .. ..                           | 3                 | ..                | 3             |

## APPENDIX No. 29—cont.

## UPPER SUBORDINATES—cont.

## A. RESEARCH SECTION—cont.

Abstract of permanent and temporary posts as on 30th June 1960—cont.

| Serial number and name of the post.   | Permanent. | Temporary. | Total. |
|---------------------------------------|------------|------------|--------|
| (1)                                   | (2)        | (3)        | (4)    |
| 16 Coconut and Tobacco .. .. .        | ..         | (13+1)     | 14     |
| 17 Chillies .. .. .                   | ..         | 2          | 2      |
| 18 Meteorology .. .. .                | 1          | 1          | 2      |
| 19 Miscellaneous (X-Ray Unit) .. .. . | ..         | 2          | 2      |
| 20 Agronomy .. .. .                   | ..         | 26         | 26     |
| Total ..                              | 105        | 181        | 286    |

## B. AGRICULTURAL SECTION.

| Serial number and name of the post.                                | Permanent. | Temporary. | Total. |
|--------------------------------------------------------------------|------------|------------|--------|
| (1)                                                                | (2)        | (3)        | (4)    |
| 1 Agricultural Demonstrator and Extension Officer for Agriculture. | 104        | 338        | 442    |
| 2 Special Agricultural Demonstrator (Cotton).                      | ..         | 19         | 19     |
| 3 Special Agricultural Demonstrator (Sugarcane).                   | ..         | 21         | 21     |
| 4 Instructor in Agriculture .. .. .                                | ..         | ..         | ..     |
| 5 Soil Conservation Assistant .. .. .                              | ..         | 34         | 34     |
| 6 Horticultural Development Assistant .. .. .                      | ..         | 25         | 25     |
| 7 Coconut Development Assistant .. .. .                            | ..         | 13         | 13     |
| 8 Tobacco Development Assistant .. .. .                            | ..         | ..         | ..     |
| 9 Oilseed Development Assistant .. .. .                            | ..         | 14         | 14     |
| 10 Assistant Lecturer in Agriculture .. .. .                       | 8          | ..         | 8      |
| 11 Farm Managers .. .. .                                           | 9          | 54         | 63     |
| 12 Marketing Assistants .. .. .                                    | 4          | 10         | 14     |
| 13 Jail Instructor in Agriculture .. .. .                          | 1          | ..         | 1      |
| 14 Journal Assistant .. .. .                                       | 1          | ..         | 1      |
| 15 Cashewnut Development Assistant .. .. .                         | ..         | 3          | 3      |
| 16 Special Agricultural Demonstrator (Tobacco).                    | ..         | 1          | 1      |
| 17 Instructor in Agriculture Rural Extension Training Centre.      | ..         | 30         | 30     |
| 18 Agronomist .. .. .                                              | ..         | 8          | 8      |
| 19 Plant Protection Assistant .. .. .                              | 5          | 55         | 60     |
| Total ..                                                           | 132        | 625        | 757    |

## APPENDIX No. 29—cont.

Strength of Engineering Staff as on 30th June 1960.

| Serial number and name of the post.                  | Permanent. | Temporary. | Total. |
|------------------------------------------------------|------------|------------|--------|
| (1)                                                  | (2)        | (3)        | (4)    |
| 1 Agricultural Engineering Supervisor ..             | 12         | 59         | 71     |
| 2 Electrical Supervisor .. .. .                      | 1          | ..         | 1      |
| 3 Agricultural Engineering Foreman ..                | 6          | 14         | 20     |
| 4 General Foreman (Agricultural Engineering Branch). | ..         | 1          | 1      |
| 5 Assistant Agricultural Engineering Foreman.        | 6          | 9          | 15     |
| 6 Senior mechanic .. .. .                            | 1          | 22         | 23     |
| 7 Junior mechanic .. .. .                            | 1          | 7          | 8      |
| 8 Mechanic, I Grade .. .. .                          | 1          | 7          | 8      |
| 9 Do. II Grade .. .. .                               | 1          | 7          | 8      |
| 10 Do. III Grade .. .. .                             | 15         | 5          | 20     |
| 11 Draughtsman, I Grade .. .. .                      | 1          | ..         | 1      |
| 12 Do. III Grade .. .. .                             | 2          | 13         | 15     |
| 13 Supervisors (Pumping and Boring) ..               | 14         | 4          | 18     |
| 14 Borewell foreman .. .. .                          | 53         | 68         | 121    |
| 15 Drillers .. .. .                                  | 19         | 5          | 24     |
| 16 Assistant drillers .. .. .                        | 25         | 8          | 33     |
| 17 Blasting supervisors .. .. .                      | ..         | 7          | 7      |
| 18 Air compressor mechanic .. .. .                   | 2          | ..         | 2      |
| 19 Lorry drivers .. .. .                             | 1          | 34         | 35     |
| 20 General foreman .. .. .                           | 1          | 1          | 2      |
| 21 Section maistries .. .. .                         | 3          | ..         | 3      |
| 22 Time-keepers .. .. .                              | 1          | ..         | 1      |
| 23 Tracer .. .. .                                    | 1          | 8          | 9      |
| 24 Inspector of Power Drills .. .. .                 | 1          | ..         | 1      |
| 25 Senior tractor driver .. .. .                     | ..         | 74         | 74     |
| 26 Junior tractor drivers .. .. .                    | ..         | 200        | 200    |
| 27 Oil engine driver .. .. .                         | ..         | 269        | 269    |
| 28 Tractor cleaner .. .. .                           | ..         | 138        | 138    |
| 29 Lorry and bus cleaner .. .. .                     | ..         | 28         | 28     |
| 30 Jeep drivers .. .. .                              | ..         | 38         | 38     |
| 31 Propaganda van driver .. .. .                     | ..         | 1          | 1      |
| 32 Truck driver .. .. .                              | ..         | 1          | 1      |
| 33 Drill supervisor .. .. .                          | ..         | 2          | 2      |
| 34 Bus driver .. .. .                                | ..         | 1          | 1      |
| 35 Stores Superintendent .. .. .                     | ..         | 3          | 3      |
| 36 Store-keeper, I Grade .. .. .                     | ..         | 14         | 14     |
| 37 Pump motor attendant .. .. .                      | ..         | 11         | 11     |
| 38 Gasman .. .. .                                    | ..         | 6          | 6      |
| 39 Turner .. .. .                                    | ..         | 2          | 2      |
| 40 Electrician .. .. .                               | ..         | 1          | 1      |
| 41 Head fitter .. .. .                               | ..         | 1          | 1      |
| 42 Fitters .. .. .                                   | ..         | 17         | 17     |

## APPENDIX No. 29—cont.

Strength of Engineering staff as on 30th June 1960—cont.

| Serial number and name of the post.          | Permanent. | Temporary. | Total. |
|----------------------------------------------|------------|------------|--------|
| (1)                                          | (2)        | (3)        | (4)    |
| 43 Coppersmith .. .. .                       | ..         | 2          | 2      |
| 44 Hammerman .. .. .                         | ..         | 3          | 3      |
| 45 Blacksmith .. .. .                        | ..         | 6          | 6      |
| 46 Welders .. .. .                           | ..         | 3          | 3      |
| 47 Moulder .. .. .                           | ..         | 1          | 1      |
| 48 Machanist .. .. .                         | ..         | 3          | 3      |
| 49 Carpenter .. .. .                         | ..         | 1          | 1      |
| 50 Wireman .. .. .                           | ..         | 2          | 2      |
| 51 Packers .. .. .                           | ..         | 3          | 3      |
| 52 Helper to wireman .. .. .                 | ..         | 2          | 2      |
| 53 Compressor driver .. .. .                 | ..         | 7          | 7      |
| 54 Rock drill operator .. .. .               | ..         | 13         | 13     |
| 55 Miller .. .. .                            | ..         | 1          | 1      |
| 56 Drill mechanics .. .. .                   | ..         | 9          | 9      |
| 57 Well testing mechanic .. .. .             | ..         | 2          | 2      |
| 58 Borewell foreman-cum-store-keeper .. .. . | ..         | 11         | 11     |
| 59 Technical Assistant .. .. .               | ..         | 1          | 1      |
| 60 Diesel Mechanic-cum-fitter .. .. .        | ..         | 1          | 1      |
| 61 Fitter helper .. .. .                     | ..         | 1          | 1      |
| 62 Soil Conservation Sub-Assistant .. .. .   | ..         | 80         | 80     |
| 63 Engineering Maistry .. .. .               | ..         | 3          | 3      |
| 64 Carpenter-cum-pattern maker .. .. .       | ..         | 1          | 1      |

## 1. Madras Ministerial Service.

| Name of post.                  | Permanent. | Temporary. | Total. |
|--------------------------------|------------|------------|--------|
| Manager .. .. .                | 1          | ..         | 1      |
| Superintendents .. .. .        | 13         | 73         | 86     |
| Head Clerks .. .. .            | ..         | 4          | 4      |
| Upper division clerks .. .. .  | 47         | 265        | 312    |
| Senior Steward .. .. .         | ..         | 1          | 1      |
| Junior Steward .. .. .         | ..         | 1          | 1      |
| Commercial Accountant .. .. .  | 1          | ..         | 1      |
| Lower division clerks .. .. .  | 166        | 657        | 823    |
| Typists .. .. .                | 44         | 158        | 202    |
| Steno-typists .. .. .          | 4          | 19         | 23     |
| Store-keeper, II Grade .. .. . | 5          | 38         | 43     |

## 2. Madras Agricultural Subordinate Service.

|                                    |     |     |     |
|------------------------------------|-----|-----|-----|
| Fieldman (Selection Grade) .. .. . | ..  | ..  | ..  |
| Do. I Grade .. .. .                | 101 | 563 | 664 |
| Do. II Grade .. .. .               | ..  | ..  | ..  |
| Artist .. .. .                     | 9   | 3   | 12  |
| Librarian .. .. .                  | ..  | 2   | 2   |

## APPENDIX No. 29—cont.

Strength of Engineering staff as on 30th June 1960—cont.

## 2. Madras Agricultural Subordinate Service—cont.

| Name of post.                  | Perma-<br>nent. | Tempo-<br>rary. | Total. |
|--------------------------------|-----------------|-----------------|--------|
| (1)                            | (2)             | (3)             | (4)    |
| Compost Development Inspector. | ..              | 181             | 181    |
| Sliver-maker .. .. .           | ..              | 1               | 1      |
| Computer .. .. .               | ..              | 1               | 1      |

## 3. Madras General Subordinate Service.

|                                                    |     |     |       |
|----------------------------------------------------|-----|-----|-------|
| Demonstration Maistris, Grade I.                   | 34  | ..  | 34    |
| Do. Grade II.                                      | 181 | 947 | 1,128 |
| Laboratory Attenders .. .. .                       | 19  | 60  | 79    |
| Attenders (Office) (including Library Attendants). | 7   | 29  | 33    |
| Kamdar .. .. .                                     | ..  | 6   | 6     |
| Inspectory Attendant .. .. .                       | 1   | ..  | 1     |

## 4. Madras Last Grade Service.

|               |     |     |     |
|---------------|-----|-----|-----|
| Peons .. .. . | 165 | 377 | 542 |
|---------------|-----|-----|-----|

## 5. Miscellaneous Post.

|                             |    |    |   |
|-----------------------------|----|----|---|
| Sanitary Inspector .. .. .  | 1  | .. | 1 |
| Museum Curator .. .. .      | 1  | .. | 1 |
| Photographer .. .. .        | 1  | .. | 1 |
| Assistant Librarian .. .. . | 1  | .. | 1 |
| Cine Operator .. .. .       | .. | 1  | 1 |

## APPENDIX No. 29—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960.

| Serial number. | Scheme number. | Name of the scheme.                                           | Name of Post.                                  | Number of sanctioned posts. | G.O. number and date.                                                                                             | From               | To                   |
|----------------|----------------|---------------------------------------------------------------|------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|
| (1)            | (2)            | (3)                                                           | (4)                                            | (5)                         | (6)                                                                                                               | (7)                | (8)                  |
| 1              | 21             | Cotton seed multiplication Scheme.                            | Special Agricultural Demonstrator (Cotton).    | 3                           | G.O. Ms. No. 919, Food and Agriculture, dated 2nd March 1959.                                                     | ..                 | 30th June 1963.      |
| 2              | 44             | Extra long staple cotton in Madras State.                     | Cotton Assistant ..                            | 2                           | G.O. Ms. No. 2433, Food and Agriculture, dated 13th August 1957.                                                  | ..                 | 22nd November 1961.  |
| 3              | 69             | Opening of Agricultural Paddy Research Station, Ambasamudram. | Paddy Assistant ..                             | 1                           | G.O. Ms. No. 278, Food and Agriculture, dated 22nd January 1960.                                                  | ..                 | 29th February 1961.  |
| 4              | 90             | Multiplication of K2 and MCU 2 cotton.                        | Special Agricultural Demonstrator (Cotton).    | 6+2 = 8                     | G.O. Ms. No. 4330, Food and Agriculture, dated 16th December 1959.                                                | ..                 | 30th September 1960. |
| 5              | 103            | Comprehensive Coconut Nursery scheme.                         | Coconut Assistant.                             | 4                           | G.O. Ms. No. 902, Industries, Labour and Co-operation, dated 22nd February 1960.                                  | 1st February 1960. | 31st January 1961.   |
| 6              | 104            | Plant Protection work.                                        | Plant Protection Assistant.                    | 47                          | G.O. Ms. No. 169, Food and Agriculture, dated 22nd January 1960.                                                  | ..                 | 28th February 1961.  |
|                |                |                                                               |                                                | 7                           | G.O. Ms. No. 2049, Food and Agriculture, dated 11th June 1960.                                                    | ..                 | 28th February 1961.  |
| 7              | 114            | Banana Research Station, Aduthurai.                           | Horticultural Assistant.                       | 2                           | G.O. Ms. No. 3777, Food and Agriculture, dated 13th December 1957.                                                | ..                 | 31st March 1961.     |
| 8              | 115            | Sugarcane Development.                                        | Special Agricultural Demonstrator (Sugarcane). | 20                          | G.O. Ms. No. 2616, Food and Agriculture, dated 21st July 1959. Memorandum 30590/B IV/60-2, dated 26th March 1960. | ..                 | 29th February 1960.* |
| 9              | 135            | Improvement of Kanyakumari Tirunelveli cotton.                | Cotton Assistant ..                            | 5                           | G.O. Ms. No. 3533, Food and Agriculture, dated 8th October 1959.                                                  | 18th June 1959.    | 17th June 1964.      |
| 10             | 156            | Fruit Products Model Orchard-cum-Nursery.                     | Horticulture Assistant.                        | 2                           | G.O. Ms. No. 764, Food and Agriculture, dated 4th March 1960.                                                     | ..                 | 28th February 1961.  |
| 11             | 169            | Statistical Assistant for Meteorological section.             | Statistical Assistant.                         | 1                           | G.O. Ms. No. 576, Food and Agriculture, dated 12th February 1959.                                                 | ..                 | 29th February 1960.* |
| 12             | 176            | Unirrigated Cambodia cotton.                                  | Cotton Assistant ..                            | 2                           | G.O. Ms. No. 1560, Food and Agriculture, dated 22nd June 1956.                                                    | ..                 | 15th September 1960. |
| 13             | 193            | Opening of Agricultural Research Station, Sathyamangalam.     | Agronomy Assistant Farm Managers.              | 1 }<br>5 }                  | G.O. Ms. No. 1014, Food and Agriculture, dated 16th March 1960.                                                   | ..                 | 28th February 1961.  |
|                |                |                                                               |                                                |                             | G.O. Ms. No. 1014, Food and Agriculture, dated 16th March 1960.                                                   | ..                 | 28th February 1961.  |
| 14             | 195            | Zonal Nucleus Seed Farm of Improved Oil Strains.              | Oilseeds Assistants ..                         | 4                           | G.O. Ms. No. 1766, Food and Agriculture, dated 7th June 1957.                                                     | ..                 | 28th February 1961.  |
| 15             | 199            | Cotton Certification Scheme.                                  | Cotton Assistant ..                            | 8                           | G.O. Ms. No. 676, Food and Agriculture, dated 27th February 1960.                                                 | ..                 | 29th February 1960.* |
| 16             | 205            | Opening of Agriculture Research Station, Damakudi.            | Paddy Assistant ..                             | 1                           | G.O. Ms. No. 400, Food and Agriculture, dated 10th February 1960.                                                 | ..                 | 28th February 1961.  |

\* Continuance awaited.

## APPENDIX No. 29—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1959—cont.

| Serial number. | Scheme number. | Name of the scheme.                                                                                                                            | Name of Post.                                                               | Number sanctioned. | G.O. number and date.                                                                                          | From                 | To                   |
|----------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------|----------------------|----------------------|
| (1)            | (2)            | (3)                                                                                                                                            | (4)                                                                         | (5)                | (6)                                                                                                            | (7)                  | (8)                  |
| 17             | 237            | Breeding of Pircularis Resistant Strains of Paddy of different duration.                                                                       | Paddy Assistant ..                                                          | 3                  | G.O. Ms. No. 1388, Food and Agriculture, dated 10th April 1958.                                                | ..                   | 31st March 1961.     |
| 18             | 242            | Improvement of Vegetable.                                                                                                                      | Horticulture Assistant.                                                     | 1                  | G.O. Ms. No. 428, Agriculture, dated 24th December 1953 Memo. 85440/B. IV/ 59-26, dated 9th June 1950.         | 18th May 1960.       | 17th July 1961.      |
| 19             | 254            | Increasing the production of oilseeds.                                                                                                         | Oilseed Assistant ..                                                        | 4                  | G.O. Ms. No. 268, Food and Agriculture dated 1st February 1960.                                                | ..                   | 28th February 1961.  |
| 20             | 260            | Research on the Physiology of Groundnut in Madras State.                                                                                       | Do.                                                                         | 2                  | G.O. Ms. No. 144, Agriculture, dated 17th January 1955. Memo 85440 B. IV/ 59-26 dated 9th June 1960.           | 18th May 1960.       | 17th August 1960.    |
| 21             | 261            | Intensive Breeding of Groundnut in Madras State.                                                                                               | Do.                                                                         | 2                  | G.O. Ms. No. 820, Agriculture, dated 22nd March 1955.                                                          | ..                   | 29th June 1961.      |
| 22             | 262            | Research on legumes and other fodders.                                                                                                         | Botany Assistant ..                                                         | 2                  | G.O. Ms. No. 1405, Food and Agriculture, dated 11th April 1959.                                                | ..                   | 28th February 1961.  |
| 23             | 263            | Research organisation and revision of Jurisdiction consequent on introduction of Community Development and National Extension Service Schemes. | Agricultural Demonstrators.                                                 | 74                 | G.O. Ms. No. 1050, Food and Agriculture, dated 18th March 1960.                                                | ..                   | ..                   |
| 24             | 266            | Sugarcane Research Scheme, Cuddalore.                                                                                                          | Sugarcane Assistant }<br>Mycology .. 1<br>Chemistry .. 2<br>Entomology .. 1 | 5                  | G.O. Ms. No. 1823, Food and Agriculture, dated 28th April 1959. Memo. 13820-B. IV/60-6, dated 20th April 1960. | 1st April 1959.      | 31st March 1960.     |
| 25             | 267            | Research on clove nutmeg and Cocoa.                                                                                                            | Horticulture Assistant                                                      | 2                  | G.O. Ms. No. 1588, Food and Agriculture, dated 2nd May 1960.                                                   | ..                   | 31st March 1965.     |
| 26             | 268            | Evolution of Drought resistant strains of paddy.                                                                                               | Paddy Assistant ..                                                          | 2                  | G.O. Ms. No. 1481, Food and Agriculture, dated 21st April 1960.                                                | 1st April 1960 ..    | 31st March 1965.     |
| 27             | 270            | Model Agronomic Experiments at Bhavanisagar.                                                                                                   | Agronomy Assistant ..                                                       | 2                  | G.O. Ms. No. 710, Food and Agriculture, dated 29th February 1960.                                              | ..                   | 28th February 1961.  |
| 28             | 272            | Stemborer of Paddy at Aduthurai.                                                                                                               | Entomology Assistant.                                                       | 1                  | G.O. Ms. No. 1960, Food and Agriculture, dated 2nd June 1958.                                                  | ..                   | 31st March 1961.     |
| 29             | 276            | Co-ordinated scheme for the Improvement of Chillies.                                                                                           | Chilly Assistant ..                                                         | 1                  | G.O. Ms. No. 1898, Agriculture, dated 29th July 1955.                                                          | 25th September 1955. | 24th September 1960. |
| 30             | 279            | Establishment of Multi-crop Fruit Research Station, Periakulam.                                                                                | Horticulture Assistant                                                      | 3                  | G.O. Ms. No. 886, Food and Agriculture, dated 28th February 1959.                                              | ..                   | 29th February 1960.  |
| 31             | 280            | Agricultural Statistical Section Statistical Assistant.                                                                                        | Statistical Assistant ..                                                    | 1                  | G.O. Ms. No. 463, Food and Agriculture, dated 13th February 1960.                                              | ..                   | 28th February 1961.  |

\* Continuance awaited.

## APPENDIX NO. 29—cont.

## List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number. | Scheme number. | Name of the scheme.               | Name of Post.         | Number sanctioned. | G.O. number and date.                                                     | From | To               |
|----------------|----------------|-----------------------------------|-----------------------|--------------------|---------------------------------------------------------------------------|------|------------------|
| (1)            | (2)            | (3)                               | (4)                   | (5)                | (6)                                                                       | (7)  | (8)              |
| 32             | 282            | Soil conservation Asis-<br>tants. | Chemistry Assistant.. | 1                  | G.O. Ms. No. 4328, Food and<br>Agriculture, dated 28th<br>December 1959.  | ..   | 31st March 1961. |
|                |                |                                   |                       | 34                 | G.O. Ms. No. 2845, Food and<br>Agriculture, dated 16th<br>August 1958.    | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 1210, Food and<br>Agriculture, dated 26th<br>March 1960.     | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 1326, Food and<br>Agriculture, dated 6th April<br>1960.      | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 468, Food and<br>Agriculture, dated 13th Feb-<br>ruary 1960. | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 1561, Food and<br>Agriculture, dated 29th April<br>1960.     | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 1283, Food and<br>Agriculture, dated 4th April<br>1960.      | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 387, Food and<br>Agriculture, dated 9th Feb-<br>ruary 1960.  | ..   | ..               |
|                |                |                                   |                       |                    | G.O. Ms. No. 4188, Food and<br>Agriculture, dated 12th<br>December 1959.  | ..   | ..               |

|    |     |                                                                                                    |                                                                                                                                               |                                        |                                                                                                                                              |    |                                            |
|----|-----|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------------------|
| 33 | 283 | Tanjore Co-operative Mar-<br>keting Society.                                                       | Special Agricultural<br>Demonstrator<br>(Sugarcane)                                                                                           | 1                                      | G.O. Ms. No. 3016, Co-operative,<br>dated 20th June 1960.                                                                                    | .. | 28th February<br>1961.                     |
| 34 | 293 | Establishment of Ground-<br>nut Experiment Station,<br>Pollachi.                                   | Oilseed Assistant ..                                                                                                                          | 2                                      | G.O. Ms. No. 661, Agriculture,<br>dated 8th March 1956.<br>G.O. Ms. No. 1840, Food and<br>Agriculture, dated 29th April<br>1959.             | .. | 10th May 1961.<br>31st March 1961.         |
| 35 | 296 | Studies on revision of<br>phosphates in laterite<br>soils in the Nilgiris.                         | Chemistry Assistant ..                                                                                                                        | 1                                      | G.O. Ms. No. 1624, Food and<br>Agriculture, dated 4th May<br>1960.                                                                           | .. | 31st March 1961.                           |
| 36 | 297 | Reclamation of Station and<br>Alkaline lands.                                                      | Do.                                                                                                                                           | 2                                      | G.O. Ms. No. 3019, Food and<br>Agriculture, dated 17th June<br>1958.                                                                         | .. | 31st March 1960.                           |
| 37 | 298 | State Seed Farm ..                                                                                 | Farm Managers ..                                                                                                                              | 47                                     | G.O. Ms. No. 1153, Food and<br>Agriculture, dated 24th March<br>1960.                                                                        | .. | 28th February<br>1961.                     |
| 38 | 299 | Strengthening of Agricul-<br>tural College.                                                        | Horticulture Assistant<br>Mycology Assistant ..<br>Botany Assistant ..<br>Chemistry Assistant..<br>Entomology Assistant..<br>Miscellaneous .. | 1 }<br>1 }<br>3 }<br>4 }<br>2 }<br>1 } | G.O. Ms. No. 2516/0, Food and<br>Agriculture dated, 9th July<br>1959.<br>G.O. Ms. No. 971, Food and<br>Agriculture, dated 4th March<br>1959. | .. | 31st May 1960<br>Continuance await-<br>ed. |
| 39 | 300 | Improvement of Meenam-<br>palayam tobacco.                                                         | Tobacco Assistant ..                                                                                                                          | 1                                      | Memo. 5202/BII-60-3, dated<br>16th March 1960.                                                                                               | .. | 31st August 1960.                          |
| 40 | 302 | Procurement of P. 216 F.<br>Cotton seeds under inter<br>cropping and double<br>cropping programme. | Special (Agricultural<br>Demonstrator),<br>Cotton.                                                                                            | 1                                      | G.O. Ms. No. 153, Food and<br>Agriculture, dated 20th<br>January 1960.                                                                       | .. | 30th September<br>1960.                    |
| 41 | 304 | Investigation of betelvine<br>diseases (Wilt).                                                     | Mycology Assistant ..                                                                                                                         | 1                                      | G.O. Ms. No. 1566, Food and<br>Agriculture, dated 29th April<br>1960.                                                                        | .. | 31st March 1963.                           |
| 42 | 305 | Urban Compost Scheme ..                                                                            | Chemistry Assistant ..                                                                                                                        | 3                                      | G.O. Ms. No. 782, Food and<br>Agriculture, dated 4th March<br>1960.                                                                          | .. | 28th February<br>1961.                     |



## APPENDIX No. 29—cont.

## List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number. | Sl. number. | Name of the scheme.                                                                | Name of Post.                                        | Number sanctioned. | G.O. number and date.                                                                                              | From            | To                                         |
|----------------|-------------|------------------------------------------------------------------------------------|------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------|
| (1)            | (2)         | (3)                                                                                | (4)                                                  | (5)                | (6)                                                                                                                | (7)             | (8)                                        |
| 43             | 309         | Organizing Training Centre for Research Workers in oilseeds at Tindivanam.         | Oilseeds Assistant ..                                | 1                  | G.O. Ms. No. 2646, Food and Agriculture, dated 8th November 1956.                                                  | ..              | For 5½ months.                             |
| 44             | 310         | Establishment of Regional Coconut Research Station in Thanjavur District.          | Coconut Development Assistant.                       | 2                  | G.O. Ms. No. 122, Food and Agriculture, dated 24th March 1960. Memorandum 18724 B. IV/60—2, dated 13th March 1960. | ..              | 31st March 1960.                           |
| 45             | 311         | Appointment of an Assistant to help the Meteorologist.                             | Meteorology Assistant.                               | 1                  | G.O. Ms. No. 1163, Food and Agriculture, dated 24th March 1960.                                                    | ..              | 28th February 1961.                        |
| 46             | 312         | Sugarcane Zonal Farm in Vadapathinangalam and Pandiarsjapuram in Madurai District. | Sugarcane Assistant.                                 | 4                  | G.O. Ms. No. 2616, Food and Agriculture, dated 21st July 1959.                                                     | ..              | 29th February 1960.                        |
| 47             | 314         | Improvement of Gur Manufacture and Storage.                                        | Chemistry Assistant.                                 | 1                  | G.O. Ms. No. 3763, Food and Agriculture, dated 2nd November 1959.                                                  | 1st April 1959. | 31st March 1961.                           |
| 48             | 319         | Khadi Scheme. ..                                                                   | Special Agricultural Demonstrator (Cotton).          | 3                  | G.O. Ms. No. 362, Food and Agriculture, dated 3rd February 1960.                                                   | ..              | 28th February 1961.                        |
| 49             | 320         | Upper Subordinates in the three Taluks of Kanyakumari district.                    | Horticulture Assistant and Agriculture Demonstrators | 1<br>3             | G.O. Ms. No. 1410, Food and Agriculture, dated 20th March 1959.                                                    | ..              | 29th February 1960. (Continuance awaited). |

|    |        |                                                                     |                                                                 |             |                                                                     |    |                                           |
|----|--------|---------------------------------------------------------------------|-----------------------------------------------------------------|-------------|---------------------------------------------------------------------|----|-------------------------------------------|
| 50 | 321    | Sugarcane Research Station, Kulitai.                                | Agronomy Assistant<br>Mycology Assistant<br>Chemistry Assistant | 3<br>1<br>1 | G.O. Ms. No. 1755, Food and Agriculture, dated 17th May 1960.       | .. | 31st March 1961.                          |
| 51 | 327    | Development of Local Manurial Resources.                            | Chemistry Assistant                                             | 2           | G.O. Ms. No. 533, Food and Agriculture, dated 18th February 1960.   | .. | 28th February 1961.                       |
| 52 | 328    | Development of Local Manurial Resources.                            | Chemistry Assistant                                             | 2           | ..                                                                  | .. | ..                                        |
| 53 | 328(a) | Fertilizer Control Order ..                                         | Agronomy Assistant                                              | 3           | G.O. Ms. No. 923, Food and Agriculture, dated 11th March 1960.      | .. | 28th February 1961.                       |
| 54 | 329    | Ghee Testing and Grading.                                           | Chemistry Assistant                                             | 3           | G.O. Ms. No. 833, Food and Agriculture, dated 29th February 1960.   | .. | 29th February 1960. (Continuance awaited) |
| 55 | 331    | Chemical investigation of the cause of blast resistance in paddy.   | Agronomy Assistant                                              | 2           | G.O. Ms. No. 2590, Food and Agriculture, dated 30th August 1957.    | .. | 31st March 1961.                          |
| 56 | 333    | Cardamom Scheme ..                                                  | Marketing Assistant.                                            | 1           | G.O. Ms. No. 644, Food and Agriculture, dated 24th February 1960.   | .. | 28th February 1961.                       |
| 57 | 334    | Green Manure Crop Scheme.                                           | Agronomy Assistant.                                             | 2           | G.O. Ms. No. 2734, Food and Agriculture, dated 9th September 1960.  | .. | 31st March 1961.                          |
| 58 | 335    | Research on Storage of Seeds Oils or cakes or groundnut.            | Mycology Assistant 1<br>Chemistry. .. 2                         | 3           | G.O. Ms. No. 2957, Food and Agriculture, dated 25th September 1957. | .. | 9th May 1960.                             |
| 59 | 338    | Cytogenetical Studies of Grape.                                     | Entomology Assistant.                                           | 1           | G.O. Ms. No. 2733, Food and Agriculture, dated 3th September 1957.  | .. | 3rd January 1963.                         |
| 60 | 339    | Development of Fruit Production (Horticultural Development Scheme). | Horticulture Development Assistant.                             | 13          | Memorandum No. 16970/B.IV/60-5, dated 12th May 1960.                | .. | 31st May 1960.                            |

## APPENDIX No. 20—cont.

## List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number. | Scheme number. | Name of the scheme.                                             | Name of Post.                                                                                                                                                          | Number sanctioned. | G.O. number and date.                                                        | From | To                   |
|----------------|----------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------|------|----------------------|
| (1)            | (2)            | (3)                                                             | (4)                                                                                                                                                                    | (5)                | (6)                                                                          | (7)  | (8)                  |
| 61             | 340            | Establishment of Parasite Breeding Station.                     | Plant Protection Assistant.                                                                                                                                            | 2                  | G.O. Ms. No. 3700, Food and Agriculture, dated 7th December 1957.            | ..   | 31st March 1962.     |
|                |                |                                                                 |                                                                                                                                                                        | 2                  | G.O. Ms. No. 2048, Food and Agriculture, dated 11th June 1960.               | ..   | 31st March 1961.     |
|                |                |                                                                 |                                                                                                                                                                        | 1                  | G.O. Ms. No. 2016, Food and Agriculture, dated 11th June 1960.               | ..   | 31st March 1961.     |
| 62             | 341            | Soil Survey of Sugarcane Crops.                                 | Chemistry Assistant.                                                                                                                                                   | 4                  | G.O. Ms. No. 1754, Food and Agriculture, dated 17th May 1960.                | ..   | 31st March 1961.     |
| 63             | 342            | Coconut Development Scheme.                                     | Coconut Development Assistant.                                                                                                                                         | 6                  | G.O. Ms. No. 123, Food and Agriculture, dated 19th January 1960.             | ..   | 28th February 1961.  |
|                |                |                                                                 |                                                                                                                                                                        | 6                  | G.O. Ms. No. 2049, Food and Agriculture, dated 11th June 1960.               | ..   | 31st March 1961.     |
| 64             | 343            | Oilseed Development Scheme.                                     | Oilseed Development Assistant.                                                                                                                                         | 8                  | G.O. Ms. No. 3400, Food and Agriculture, dated 8th November 1957.            | ..   | 2nd March 1962.      |
|                |                |                                                                 |                                                                                                                                                                        | 2                  | G.O. Ms. No. 649, Food and Agriculture, dated 26th February 1960.            | ..   | 31st March 1961      |
| 65             | 345            | Tobacco Development Scheme.                                     | Special Agricultural Demonstrator (Tobacco).                                                                                                                           | 1                  | G.O. Ms. No. 1500, Food and Agriculture, dated 23rd April 1958.              | ..   | 30th June 1960.      |
| 66             | 346            | Agricultural Demonstrator for clearing audit objection.         | Agricultural Demonstrator.                                                                                                                                             | 1                  | G.O. Ms. No. 797, Food and Agriculture, dated 5th March 1960.                | ..   | 31st August 1960.    |
| 67             | 347            | Rapid multiplication of hybrid Cumbu.                           | Millet Assistant                                                                                                                                                       | 1                  | G.O. Ms. No. 335, Food and Agriculture, dated 5th February 1960.             | ..   | 28th February 1961.  |
| 68             | 348            | Research on Fungicides.                                         | Mycology Assistant.                                                                                                                                                    | 1                  | G.O. Ms. No. 2229, Food and Agriculture, dated 30th June 1958.               | ..   | 31st March 1961.     |
| 69             | 349            | Post Graduate Course.                                           | Millet Assistant. pulses 1<br>Horticulture Assis- 2<br>tant.<br>Myecology Assistant 1<br>Chemistry Assistant 1<br>Entomology Assis- 1<br>tant.<br>Agronomy Assistant 1 |                    | G.O. Ms. No. 630, Food and Agriculture, dated 28th February 1960.            | ..   | 28th February 1961.  |
| 70             | 350            | Scheme for Multiplication and distribution of K5. Cotton seeds. | Special Agricultural Demonstrator (Cotton).                                                                                                                            | 4                  | G.O. Ms. No. 331, Food and Agriculture, dated 4th October 1958.              | ..   | 30th September 1960. |
| 71             | 351            | Instructor in Agriculture R.E.T.C.                              | Instructor                                                                                                                                                             | 29                 | G.O. Ms. No. 820, Public (Rural Development Project), dated 12th March 1959. | ..   |                      |
| ..             | ..             | ..                                                              | ..                                                                                                                                                                     | ..                 | G.O. Ms. No. 912, Public (Rural Development Project), dated 18th March 1959. | ..   |                      |
| ..             | ..             | ..                                                              | ..                                                                                                                                                                     | ..                 | G.O. Ms. 913, Public (Rural Development Project), dated 18th March 1959.     | ..   |                      |
| ..             | ..             | ..                                                              | ..                                                                                                                                                                     | ..                 | G.O. Ms. No. 914, Public (Rural Development Project), dated 18th March 1959. | ..   | 28th February 1961.  |

## APPENDIX No. 29—cont.

## List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number | Scheme number | Name of the scheme.                                                                       | Name of Post.                      | Number sanctioned. | G.O. number and date.                                                                           | From | To                  |
|---------------|---------------|-------------------------------------------------------------------------------------------|------------------------------------|--------------------|-------------------------------------------------------------------------------------------------|------|---------------------|
| (1)           | (2)           | (3)                                                                                       | (4)                                | (5)                | (6)                                                                                             | (7)  | (8)                 |
| ..            | ..            | ..                                                                                        | ..                                 | ..                 | G.O. Ms. No. 783, Public (Rural Development Project), dated 10th March 1959.                    | ..   | 28th February 1961. |
| ..            | ..            | ..                                                                                        | ..                                 | ..                 | G.O. Ms. No. 784, Public (Rural Development Project), dated 10th March 1959.                    | ..   | ..                  |
| ..            | ..            | ..                                                                                        | ..                                 | ..                 | G.O. Ms. No. 875, Public (Rural Development Project), dated 17th March 1959.                    | ..   | ..                  |
| ..            | ..            | ..                                                                                        | ..                                 | ..                 | G.O. Ms. No. 35 (Rural Development Project), and Local Administration, dated 20th January 1960. | ..   | ..                  |
| 72            | 352           | Simple manual Trials on cultivators field.                                                | Chemistry Assistant..              | 4                  | G.O. Ms. No. 1646, Food and Agriculture, dated 16th April 1959.                                 | ..   | 31st March 1960.    |
| 73            | 353           | Evolution of paddy strains for inundated areas.                                           | Paddy Assistant ..                 | 1                  | G.O. Ms. No. 2863, Food and Agriculture, dated 18th August 1958.                                | ..   | For Three years.    |
| 74            | 355           | Production of Hybrid Castor and for Evolving short duration/castor strains/high yielding. | Oilseed Assistant ..               | 2                  | G.O. Ms. No. 3054, Food and Agriculture, dated 4th September 1958.                              | ..   | Five years.         |
| 76            | 356           | Development of Fruit products Establishment of Model Orchard-cum-Nursery.                 | Horticulture Assistant.            | 4                  | G.O. Ms. No. 4031, Food and Agriculture, dated 10th December 1958.                              | ..   | One year.           |
| 76            | 357           | Development of cashew cultivation.                                                        | Cashew Development Assistant.      | 2                  | G.O. Ms. No. 1743, Food and Agriculture, dated 22nd April 1959.                                 | ..   | ..                  |
| 77            | 358           | Soil Survey work in the area.                                                             | Chemistry Assistant.               | 3                  | G.O. Ms. No. 1919, Food and Agriculture, dated 7th May 1959.                                    | ..   | 31st March 1960*    |
| 78            | 359           | Extension Officer, Agri-culture.                                                          | Extension Officer for Agriculture. | 4                  | G.O. Ms. No. 1698, Food and Agriculture, dated 11th May 1960.                                   | ..   | 30th April 1960.    |
|               |               |                                                                                           |                                    | 201                | G.O. Ms. No. 255, Rural Development and Local Administration, dated 5th April 1960.             | ..   | ..                  |
|               |               |                                                                                           |                                    |                    | G.O. Ms. No. 370, Rural Development and Local Administration, dated 7th May 1960.               | ..   | ..                  |
|               |               |                                                                                           |                                    |                    | G.O. Ms. No. 406, Rural Development and Local Administration, dated 2nd April 1960.             | ..   | ..                  |
|               |               |                                                                                           |                                    |                    | G.O. Ms. No. 279, Rural Development and Local Administration, dated 2nd April 1960.             | ..   | ..                  |
|               |               |                                                                                           |                                    |                    | G.O. Ms. No. 477, Rural Development and Local Administration, dated 20th June 1960.             | ..   | ..                  |
|               |               |                                                                                           |                                    |                    | G.O. Ms. No. 86, Rural Development and Local Administration, dated 6th February 1960.           | ..   | 28th February 1961. |

\* Continuance awaited.

## APPENDIX No. 29—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number. | Scheme number. | Name of the scheme.                  | Name of Post.                           | Number sanctioned. | G.O. number and date.                                                                            | From.               | To. |
|----------------|----------------|--------------------------------------|-----------------------------------------|--------------------|--------------------------------------------------------------------------------------------------|---------------------|-----|
| (1)            | (2)            | (3)                                  | (4)                                     | (5)                | (6)                                                                                              | (7)                 | (8) |
| 359            |                | Extension Officer, Agriculture—cont. | Extension Officer for Agriculture—cont. | 201                | G.O. Ms. No. 106, Rural Development and Local Administration, dated 13th February 1960.          |                     |     |
|                |                |                                      |                                         |                    | G.O. Ms. No. 130 Rural Development and Local Administration, dated 23rd February 1960.           |                     |     |
|                |                |                                      |                                         |                    | G.O. Ms. No. 139, Rural Development and Local Administration, dated 24th February 1960.          |                     |     |
|                |                |                                      |                                         |                    | G.O. Ms. Nos. 140, and 141, Rural Development and Local Administration, 24th February 1960.      |                     |     |
|                |                |                                      |                                         |                    | G.O. Ms. No. 158, Rural Development and Local Administration, dated 27th February 1960.          |                     |     |
|                |                |                                      |                                         |                    | G.O. Ms. Nos. 161 and 162, Rural Development and Local Administration, dated 29th February 1960. |                     |     |
|                |                |                                      |                                         |                    |                                                                                                  | 28th February 1961. |     |

|    |     |                                                        |                                                |        |                                                                 |    |                      |
|----|-----|--------------------------------------------------------|------------------------------------------------|--------|-----------------------------------------------------------------|----|----------------------|
| 79 | 360 | Salvage of dry cows' farm, Alamady.                    | Farm Manager                                   | 2      | G.O. Ms. No. 1161, Food and Agriculture, dated 13th March 1959. | .. | 28th February 1960.* |
| 80 | 361 | Trial of biological measure in soil conservation work. | Entomology Assistant.<br>Agronomy Assistant .. | 2<br>2 | G.O. Ms. No. 1464, Food and Agriculture, dated 30th March 1959. | .. | 29th February 1960.  |

\* Continuance awaited.

## APPENDIX No. 29—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number. | Scheme number. | Name of the scheme.                      | Name of Post.                              | Number sanctioned. | G.O. number and date.                                                                            | From. | To.                 |
|----------------|----------------|------------------------------------------|--------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------|-------|---------------------|
| (1)            | (2)            | (3)                                      | (4)                                        | (5)                | (6)                                                                                              | (7)   | (8)                 |
|                | 359            | Extension Officer, Agriculture—<br>cont. | Extension Officer for<br>Agriculture—cont. | 201                | G.O. Ms. No. 106, Rural Development and Local Administration, dated 13th February 1960.          |       |                     |
|                |                |                                          |                                            |                    | G.O. Ms. No. 130 Rural Development and Local Administration, dated 23rd February 1960.           |       |                     |
|                |                |                                          |                                            |                    | G.O. Ms. No. 139, Rural Development and Local Administration, dated 24th February 1960.          |       |                     |
|                |                |                                          |                                            |                    | G.O. Ms. Nos. 140, and 141, Rural Development and Local Administration, 24th February 1960.      |       |                     |
|                |                |                                          |                                            |                    | G.O. Ms. No. 156, Rural Development and Local Administration, dated 27th February 1960.          |       |                     |
|                |                |                                          |                                            |                    | G.O. Ms. Nos. 161 and 162, Rural Development and Local Administration, dated 29th February 1960. |       | 28th February 1961. |

|    |     |                                                         |                       |   |                                                                                      |    |                      |
|----|-----|---------------------------------------------------------|-----------------------|---|--------------------------------------------------------------------------------------|----|----------------------|
|    |     |                                                         |                       |   | G.O. Ms. No. 187, Rural Development and Local Administration, dated 5th March 1960.  |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 196, Rural Development and Local Administration, dated 8th March 1960.  |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 207, Rural Development and Local Administration, dated 11th March 1960. |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 222, Rural Development and Local Administration, dated 17th March 1960. |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 226, Rural Development and Local Administration, dated 18th March 1960. |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 232, Rural Development and Local Administration, dated 21st March 1960. |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 254, Rural Development and Local Administration, dated 25th March 1960. |    |                      |
|    |     |                                                         |                       |   | G.O. Ms. No. 1661, Food and Agriculture, dated 7th March 1960.                       |    | 28th February 1960.* |
| 79 | 360 | Salvage of dry cows' farm, Alamady.                     | Farm Manager          | 2 | G.O. Ms. No. 1101, Food and Agriculture, dated 13th March 1959.                      | .. |                      |
| 80 | 361 | Trials of biological measure in soil conservation work. | Entomology Assistant. | 2 | G.O. Ms. No. 1464, Food and Agriculture, dated 30th March 1959.                      | .. | 29th February 1960.  |
|    |     |                                                         | Agronomy Assistant .. | 2 |                                                                                      |    |                      |

\* Continuance awaited.

*List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.*

| Serial number. | Name of the scheme.                                                          | Name of Post.               | Number sanctioned. | G.O. number and date.                                                 | From.          | To.              |
|----------------|------------------------------------------------------------------------------|-----------------------------|--------------------|-----------------------------------------------------------------------|----------------|------------------|
| (1)            | (3)                                                                          | (4)                         | (5)                | (6)                                                                   | (7)            | (8)              |
| 81             | Intensive breeding of guinea fow.                                            | Oilseed Assistant           | 2                  | G.O. Ms. No. 1987, Food and Agriculture, dated 8th June 1960.         | 9th July 1960. | 8th July 1961.   |
| 82             | Investigation into the methods and practices of farming in various stations. | Agronomy Assistant.         | 3                  | Memo. No. 24095-B-II/60-6, dated 8th June 1960.                       | ..             | 5th August 1960. |
| 83             | Establishment of three vegetable production centres.                         | Horticulture Assistant.     | 3                  | G.O. Ms. No. 1393, Food and Agriculture, dated 26th March 1959.       | 4th July 1959. | 3rd July 1960.   |
| 84             | Agmark grading ..                                                            | Chemistry Assistant.        | 2                  | G.O. Ms. No. 1137, Food and Agriculture, dated 23rd March 1960.       | 7th July 1959. | 6th July 1960.   |
|                |                                                                              | Marketing Assistant.        | 8                  | G.O. Ms. No. 1797, Food and Agriculture, dated 23rd May 1960.         | ..             | 31st March 1961. |
| 85             | Gur grading ..                                                               | Chemistry Assistant.        | 17                 | G.O. Ms. No. 1220, Food and Agriculture, dated 30th March 1960.       | ..             | Do.              |
| 86             | Vacational training to Elementary school teachers.                           | Agricultural Demonstrator.  | 9                  | G.O. Ms. No. 1844, Food and Agriculture, dated 30th April 1959.       | ..             | Not started      |
| 87             | Research to improve and stabilise off-seasonal mangoes.                      | Horticulture Assistant.     | 1                  | G.O. Ms. No. 1371, Food and Agriculture, dated 24th March 1959.       | ..             | One year.        |
| 88             | Effective Plant Protection Measures on Oilseeds.                             | Plant Protection Assistant. | 3                  | Memo. No. 66604-B.IV/58-16, Food and Agriculture, dated 4th May 1959. | ..             | Do.              |

|     |     |                                                                           |                                 |   |                                                                                              |    |                      |
|-----|-----|---------------------------------------------------------------------------|---------------------------------|---|----------------------------------------------------------------------------------------------|----|----------------------|
| 89  | 370 | Reconnaissance of soil survey.                                            | Soil survey Assistant.          | 3 | Memo. No. 66604-B.IV/58-16, Food and Agriculture, dated 4th May 1960.                        | .. | One year.            |
| 90  | 371 | Establishment of four demonstration coconut in the Kazhuvelli Swamp area. | Cocoanut Development Assistant. | 1 | G.O. Ms. No. 1986, Food and Agriculture, dated 8th June 1960.                                | .. | 28th February 1961.  |
| 91  | 372 | Establishment of an extension section.                                    | Agriculture Demonstrator.       | 5 | G.O. Ms. No. 2136, Food and Agriculture, dated 28th May 1959.                                | .. | 28th February 1960.* |
| 92  | 373 | Breeding short-term Rice strains possessing seed dormancy.                | Paddy Assistant                 | 2 | G.O. Ms. No. 1944, Food and Agriculture, dated 11th May 1959.                                | .. | 31st March 1960.*    |
| 93  | 374 | Agronomic research in the black soil region.                              | Agronomic Assistant.            | 1 | G.O. Ms. No. 2210, Food and Agriculture, dated 6th June 1959.                                | .. | One year.            |
| 94  | 375 | New varieties of Dolichos lab-lab.                                        | Millet and Pulses Assistant.    | 1 | G.O. Ms. No. 1659, Food and Agriculture, dated 7th May 1960.                                 | .. | 31st March 1961.     |
| 95  | 376 | Joint farming society in Beggapuram.                                      | Agricultural Demonstrator.      | 1 | G.O. Ms. No. 1174, Industries, Labour and Co-operation (Co-operation), dated 5th March 1960. | .. | Do.                  |
| 96  | 377 | Cattle colony at Madhavaram.                                              | Do.                             | 1 | G.O. Ms. No. 2190, Food and Agriculture, dated 4th June 1959.                                | .. | 28th February 1960.* |
| 97  | 378 | X-Ray Unit Scheme ..                                                      | X-Ray Assistant                 | 1 | G.O. Ms. No. 2071, Food and Agriculture, dated 21st May 1959.                                | .. | 31st March 1960.*    |
| 98  | 379 | Additional staff to Systematic Botanist and Professor of Botany.          | Botany Assistant                | 1 | G.O. Ms. No. 524, Food and Agriculture, dated 17th February 1960.                            | .. | 28th February 1961.* |
| 99  | 380 | Evolution of superior saline alkaline Resistant strains of paddy.         | Paddy Assistant                 | 3 | G.O. Ms. No. 1909, Food and Agriculture, dated 1st June 1960.                                | .. | 31st March 1961.*    |
| 100 | 381 | Study of Nitrogen fixing blue green Algae in Rice Soils.                  | Mycology Assistant              | 1 | G.O. Ms. No. 2563, dated 1st August 1959.                                                    | .. | 31st March 1960.*    |

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\* Continuance awaited.

## List of temporary posts of Upper Subordinates under various schemes as on 30th June 1960—cont.

| Serial number. | Scheme number. | Name of the scheme.                                                                           | Name of Post.                       | Number mentioned. | G.O. number and date.                                                                           | From | To                        |
|----------------|----------------|-----------------------------------------------------------------------------------------------|-------------------------------------|-------------------|-------------------------------------------------------------------------------------------------|------|---------------------------|
| 101            | (1) (2)        | (3)                                                                                           | (4)                                 | (5)               | (6)                                                                                             | (7)  | (8)                       |
| 101            | 382            | Development of Coconut cultivation in Ramana-thapuram.                                        | Cocoanut Assistant.                 | 1                 | G.O. Ms. No. 2997, Food and Agriculture, dated 13th August 1959.                                | ..   | One year                  |
| 102            | 383            | Training of Gardeners and young men belonging to backward class.                              | Horticulture Assistant.             | 1                 | G.O. Ms. No. 3090, Food and Agriculture, dated 25th August 1959.                                | ..   | Do.                       |
| 103            | 384            | Co-ordinated manurial Trials on Groundnut.                                                    | Oilseed Assistant                   | 6                 | G.O. Ms. No. 2823, Food and Agriculture, dated 29th July 1959.                                  | ..   | Do.                       |
| 104            | 385            | Government Basic Training College, Orathanad—Employment of an Instructor in Agriculture.      | Instructor in Agriculture.          | 1                 | G.O. Ms. No. 571, Education and Local Administration Department.                                | ..   | Up to 30th June 1961.     |
| 105            | 386            | Establishment of a soil testing laboratory at Aduthurai.                                      | Chemistry Assistant                 | 3                 | G.O. Ms. No. 1137, Food and Agriculture, dated 23rd March 1960.                                 | ..   | Up to 28th February 1961. |
| 106            | 387            | Harijan Welfare Development of Horticulture in Periyakulam Hills sinking of Irrigation wells. | Horticulture Development Assistant. | 2                 | G.O. Ms. No. 1430 (Harijan Welfare) Industries, Labour and Co-operation, dated 17th March 1960. | ..   | Do.                       |
| 107            | 388            | Improvement of pernil vegetable in Madras State.                                              | Horticulture Assistant.             | 1                 | G.O. Ms. No. 1472, Food and Agriculture, dated 20th April 1960.                                 | ..   | Up to 31st March 1961.    |
| 108            | 389            | Adoption of Metric System of Weights and Measures.                                            | Special Officer                     | 1                 | G.O. Ms. No. 1702, Food and Agriculture, dated 12th May 1960.                                   | ..   | Up to 29th February 1961. |

\* Continuance awaited.

## APPENDIX No. 30.

## Statement showing the cases of defalcations, etc., for the period from 1st July 1959 to 30th June 1960.

| Serial number. | Number of cases of defalcations, pending at the beginning of the year under report. | The place of occurrence.              | When the irregularities were detected. | Amount involved.    | For what period the irregularities were kept unremedied.                                      | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                            | Number of new cases detected during the year with details of the cases. | Remarks. |
|----------------|-------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------|---------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|
| (1)            | (2)                                                                                 | (3)                                   | (4)                                    | (5)                 | (6)                                                                                           | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                | (9)                                                                     | (10)     |
| 1              | 1947-48-1                                                                           | Papanasam (Thanjavur district).       | As early in 1947-48.                   | Rs. A. P. 5,600 5 9 | 1948 to 1954 ..                                                                               | ..                                           | Appeal filed in the Court of District Judge, Thanjavur, on 14th June 1957 was decreed in favour of Government with costs. Execution petition has been filed in respect of one defendant. The question of filing execution petition in respect of the other defendants is under correspondence with the Government Pleader, Madras. | ..                                                                      | ..       |
| 2              | 1949-1                                                                              | Saidapet Depot (Chingleput district). | 1949 ..                                | 2,084 0 11          | Civil suit was launched and decree obtained, execution petition filed against the defendants. | ..                                           | The amount of Rs. 2,084-0-11 (with costs, Rs. 2,582-8-0) is being recovered from the pay of the then Agricultural Demonstrator concerned. The recoveries are effected at Rs. 35 per mensem and they are in progress. Execution petition filed against the sureties of the ex-Store-keeper for an amount of Rs. 200 is still        | ..                                                                      | ..       |

APPENDIX No. 30—*cont.*

*Statement showing the cases of defalcations, etc., for the period from 1st July 1959 to 30th June 1960—cont.*

| Serial number. | Number of cases of defalcations, etc. pending at the beginning of the year under report. | The place of occurrence.           | When the irregularities were detected. | Amount involved. | For what period the irregularities were kept unremedied. | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                                                       | Number of new cases detected during the year | Remarks. |
|----------------|------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------|------------------|----------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|
| (1)            | (2)                                                                                      | (3)                                | (4)                                    | (5)              | (6)                                                      | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                                           | (9)                                          | (10)     |
| 3              | 1951-1 ..                                                                                | Tindivanam (South Arcot district). | 1951 ..                                | 3,725 13 5       | 6 Years                                                  | ..                                           | ..                                                                                                                                                                                                                                                                                                                                                            | ..                                           | ..       |
|                |                                                                                          |                                    |                                        | RS. A. P.        |                                                          |                                              | pending. The final report from District Agricultural Officer, Guindy, is awaited.                                                                                                                                                                                                                                                                             |                                              |          |
|                |                                                                                          |                                    |                                        |                  |                                                          |                                              | It was brought to the notice of the Director of Agriculture that said Anantham Pillai had died on 4th September 1959. Government have been addressed to write off the amount of Rs. 1,273-12-3 due from him in this case along with the other dues due from him as there was no other possibility of recovering the amount. Orders of Government are awaited. |                                              |          |
| 4              | 1952-1 ..                                                                                | Cuddalore (South Arcot district).  | 1952 ..                                | 1,145 8 2        | 4 Years                                                  | ..                                           | ..                                                                                                                                                                                                                                                                                                                                                            | ..                                           | ..       |
|                |                                                                                          |                                    |                                        |                  |                                                          |                                              | The Civil suit in the case was decreed for Rs. 1,056-8-7 with subsequent interest and proportionate costs against the amount of Rs. 1,145-8-2. Government Orders have been                                                                                                                                                                                    |                                              |          |

obtained for write off of an amount of Rs. 358-15-7, i.e., the amount disallowed by the Government. Separate action is being taken for the recovery of the amount decreed.

Deficits were noticed in the Kumbakonam and Papanasam depots when Sri V. Ramesan was in additional charge of Kumbakonam depot. The question of fixation of responsibility for the deficits and for sending a report to Government in connection with the proposal sent to Government for filing a civil suit against Sri V. Ramesan is separately under examination.

A sum of Rs. 4,160-84 nP. ordered from Sri K. Ambikacharan, Agricultural Demon- strator has been modified as a token recovery of Rs. 1,000 by Government. A sum of Rs. 2,191 was recovered from his pay and the question of refunding the balance amount of Rs. 1,191 is under considera- tion. The question of filing a civil suit for the amount due from the clerks is under con- sideration and the property particulars of the clerks are still awaited from the District Agricultural Officer, Chingle- put.



## APPENDIX No. 30—cont.

Statement showing the cases of defalcations, etc., for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number. | Number of cases of defalcations, etc., pending at the beginning of the year under report. | The place of occurrence. | When the irregularities were detected.                  | Amount involved.       | For what period the irregularities were kept unremedied.        | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                                                                        | Number of new cases detected during the year with details of the cases. | Remarks. |
|----------------|-------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------|------------------------|-----------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|
| (1)            | (2)                                                                                       | (3)                      | (4)                                                     | (5)                    | (6)                                                             | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                                                            | (9)                                                                     | (10)     |
| 7              | 1953—1                                                                                    | Tiruvellore depot.       | Audit report for the period ending 30th September 1953. | RS. A. P.<br>3,886 8 3 | Departmental action taken against the subordinates during 1955. |                                              | Recovery to the extent of Rs. 1,808-2-6 was ordered from Sri A. Varadachari formerly depot clerk, Tiruvellore. For the balance amount still to be recovered from him action against the sureties is being taken. Sri A. Varadachari has been removed from service for wilful absence from duty. A sum of Rs. 1,453-34 nP. is still pending to be recovered as detailed below:— |                                                                         |          |
|                |                                                                                           |                          |                                                         |                        |                                                                 |                                              | RS. nP.                                                                                                                                                                                                                                                                                                                                                                        |                                                                         |          |
|                |                                                                                           |                          |                                                         |                        |                                                                 |                                              | Sri Chandrasekharan .. 551 00                                                                                                                                                                                                                                                                                                                                                  |                                                                         |          |
|                |                                                                                           |                          |                                                         |                        |                                                                 |                                              | Sri Varadachari .. 709 68                                                                                                                                                                                                                                                                                                                                                      |                                                                         |          |
|                |                                                                                           |                          |                                                         |                        |                                                                 |                                              | Sri Sriramalingam .. 192 66                                                                                                                                                                                                                                                                                                                                                    |                                                                         |          |
|                |                                                                                           |                          |                                                         |                        |                                                                 |                                              | <u>1,453 34</u>                                                                                                                                                                                                                                                                                                                                                                |                                                                         |          |

Action is being taken to recover the amounts from the subordinates by the District Agricultural Officers, Gundy and Chingleput.

The balance amount taken up for recovery in this case is Rs. 5,318-3-9 Government passed orders that this amount be recovered from the following Officers as detailed below:—

|                                                                                                    |                        |
|----------------------------------------------------------------------------------------------------|------------------------|
| Sri S. Kasiviswanathan, A.D.                                                                       | RS. A. P.<br>1,600-0-0 |
| Sri K. C. Thomas, D.A.O.                                                                           | 1,908-3-9              |
| Sri A. N. Annaswamy Iyer.                                                                          | 1,600-0-0              |
| Amount adjusted from the security deposit of the clerk concerned including the amount written off. | 210-0-0                |
|                                                                                                    | <u>5,318-3-9</u>       |

The Agricultural Demonstrator Sri S. Kasiviswanathan has preferred an appeal to Government against the recovery orders. Their orders are awaited. The recovery from Sri K. C. Thomas is being effected at Rs. 50 p. m. The recovery from Sri A. K. Annaswamy Iyer has not been given effect to as there is another case

8 1953—1 — Madurai depot (theft case). 1953 — 11,801 7 6 ..

## APPENDIX No. 30—cont.

Statement showing the case of defalcations, etc., for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number. | Number of cases of defalcations, etc. pending at the beginning of the year under report. | The place of occurrence.               | When the irregularities were detected. | Amount involved. | For what period the irregularities were kept unremedied.                            | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                                | Number of new cases detected during the year with details of the cases. | Remarks. |
|----------------|------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|------------------|-------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|
| (1)            | (2)                                                                                      | (3)                                    | (4)                                    | (5)              | (6)                                                                                 | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                    | (9)                                                                     | (10)     |
|                |                                                                                          |                                        |                                        | RS. A. P.        |                                                                                     |                                              |                                                                                                                                                                                                                                                                                                                                        |                                                                         |          |
| 9              | 1954—1                                                                                   | Engineering Stores, Guindy.            | 1954                                   | 5,619 7 0        | Departmental action taken against the Agricultural Engineers, Senior mechanic, etc. | ..                                           | taken up against him for which recovery orders have to be passed by Government.                                                                                                                                                                                                                                                        | ..                                                                      | ..       |
|                |                                                                                          |                                        |                                        |                  |                                                                                     |                                              | Sri K. R. Srinivasan, Agricultural Engineer concerned has been discharged from service by terminating his probation. The Assistant Agricultural Engineer, Saidapet has been instructed to assess the loss to recover the amount from him. Final report is awaited.                                                                     | ..                                                                      | ..       |
| 10             | 1954—1                                                                                   | Central Agricultural Stores, Saidapet. | 1954                                   | 88,900 10 6      | 1949-54                                                                             | ..                                           | In G.O. Ms. No. 1788, Food and Agriculture, dated 29th April 1959 Government passed orders for the recovery and award of suitable punishment to the persons concerned. Action has been taken. Final orders have not yet been passed in respect of Sri K. Natarajan and Sri S. E. Anantharaman in regard to punishment. Full recoveries | ..                                                                      | ..       |

have been effected from Sri K. Gopalakrishnan, Sri A. Thirumalaiyengar, Radhakrishnan.

Orders have been issued to effect the recovery from Sri K. Viswanathan Nair in full from the arrears of pension. In the case of Sri Krishnan Shetty and Sri K. Subramaniam recovery is being effected from their anticipatory and final pension. Report ranging recovery from Sri C. R. Shanmugam, P. Rajavadanam and Sri B. S. R. Anjanayalu is under correspondence. The question of write off in respect of the amount due from Sri S. Thangavelu is separately under consideration. As regards Sri Nagaraja Rao the matter is pending with the Collector of Salem. Regarding Sri P. S. Murthi, the matter is under examination. As regards Sri T. B. Thirunavukarasu, recovery is being effected by the Director of Industries and Commerce.

The clerk concerned Sri N. Sitarman has absconded. A Police complaint has been lodged and the case has been entered in the list of long pending cases. Charges have been framed for the loss of cash. But final orders have

|    |         |                                                |      |                                                                                                 |    |    |    |    |    |
|----|---------|------------------------------------------------|------|-------------------------------------------------------------------------------------------------|----|----|----|----|----|
| 11 | 1954—1— | Engineering Section, Tiruchirappalli district. | 1954 | Loss of cash Rs. 1,485-9-3, value of deficits noticed in the Engineering Stores, Rs. 7,296-9-0. | .. | .. | .. | .. | .. |
|----|---------|------------------------------------------------|------|-------------------------------------------------------------------------------------------------|----|----|----|----|----|

## APPENDIX No. 30—cont.

Statement showing the cases of defalcations, etc., for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number. | Number of cases of defalcations, etc., pending at the beginning of the year under report. | The place of occurrence.       | When the irregularities were detected. | Amount involved. | For what period the irregularities were kept unremedied. | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number of new cases detected during the year with details of the case. | Remarks. |
|----------------|-------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------|------------------|----------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------|
| (1)            | (2)                                                                                       | (3)                            | (4)                                    | (5)              | (6)                                                      | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | (9)                                                                    | (10)     |
|                |                                                                                           |                                |                                        | RS.              |                                                          |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                        |          |
| 12             | 1956-1 ..                                                                                 | Vellore (North Arcot district. | December 1956.                         | 7,782 57         | ....                                                     | ..                                           | not yet been passed. The result about the fixation of responsibility for the deficits noticed in Engineering Stores in Trichirappalli is awaited to take consolidated action. The Accounts Officer's detailed report in the case has been furnished to the Assistant Agricultural Engineer (Inspection), Vellore, with instructions to set right the losses and to assess the final loss. The Accounts Officer has also been asked by the Director of Agriculture to finalise this loss after checking the accounts at Vellore. In the meantime the responsibility of the Agriculture Engineers concerned in the case has also taken up separately and he has been asked to show cause why the loss for which he is responsible indisputably should not be recovered from him. His explanation has since been received and it is under consideration in consultation with the Accounts Officer. |                                                                        |          |

Out of the sum of Rs. 4882-8-4 the extent of loss relating to Andhra and Mysore State is Rs. 2180-9-10 plus Rs. 39-12-0 respectively. The Andhra and Mysore Governments have already been addressed for recovery of the above amounts from the parties concerned. Out of the balance amount of Rs. 2862-2-6 relating to Madras State the amount recoverable from the parties is Rs. 2271-8-6. Out of this amount an amount of Rs. 1055-12-5 has been settled and the balance is yet to be (Rs. 1215-10-1) adjusted or recovered from the parties and the rest Rs. 390-12-0 from the Officials concerned. The Officials concerned have been directed to show cause against the recovery. The matter is under examination.

|           |                      |                |                   |                        |            |    |                                                                                                                                                                                                                      |    |    |
|-----------|----------------------|----------------|-------------------|------------------------|------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| 13        | 1956 1 ..            | Saidapet ..    | 1956 ..           | RS. A. P.<br>4,882 8 4 | 1949-54 .. | .. | ..                                                                                                                                                                                                                   | .. | .. |
| 1957-1 .. | Seed Stores, Madras. | 21st May 1957. | RS. N.P.<br>55 40 | ..                     | ..         | .. | The Store-keeper Sri A. Rathnavelu was convicted and dismissed from service. The final loss is to be assessed after completing further period of audit of seed stores to effect the recovery from his cash security. | .. | .. |

## APPENDIX No. 30—cont.

Statement showing the cases of defalcations, etc., for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number | Number of cases of defalcations etc., pending at the beginning of the year under report. | The place of occurrence.                                    | When the irregularities were detected. | Amount involved.                                 | For what period the irregularities were kept unremedied. | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Number of new cases detected during the year with details of the cases. | Remarks. |
|---------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------|--------------------------------------------------|----------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|
| (1)           | (2)                                                                                      | (3)                                                         | (4)                                    | (5)                                              | (6)                                                      | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (9)                                                                     | (10)     |
| 15            | 1958—1 ..                                                                                | Tirthurai-poondi Depot (Thanjavur district).                | 1958 ..                                | RS. NP. 44,878 00                                | 1958-57 1957-58                                          | ..                                           | The Collector of Thanjavur has been requested to take action against the persons concerned, viz., Depot Clerks, Extension Officer for Agriculture and Block Development Officer. The police has completed the investigation. The Collector has given his concurrence for prosecution further report is awaited.                                                                                                                                                                                                  | ..                                                                      | ..       |
| 16            | 1958—1 ..                                                                                | Nedumbalam State Seed Farm, Pattukottai.                    | 1953-58                                | 1,505 75                                         | ..                                                       | ..                                           | The persons responsible are still placed under suspension. An amount of Rs. 1,434-20 nP. has been recovered from the depot clerks and an amount of Rs. 161-59 nP. is still pending recovery. The Agricultural Demonstrator concerned has been punished with stoppage of increment. Both the depot clerks have been acquitted in the session court, Nagapattinam. The question of reinstating them in service is under consideration.                                                                             | ..                                                                      | ..       |
| 17            | 1959—1 ..                                                                                | Jeeyapuram Trichirappalli district.                         | 1959 ..                                | 541 25                                           | ..                                                       | ..                                           | The depot clerk has been ordered to be placed under suspension. The complaint has been lodged with the Police. Departmental action has also been taken against him for effecting recovery and awarding a suitable punishment. Final orders have been passed by the District Agricultural Officer, Trichirappalli (North) for the recovery of the whole amount from the pay of clerk at Rs. 25 per mensem and five instalments have already been recovered.                                                       | ..                                                                      | ..       |
| 18            | 1959—1 ..                                                                                | Agricultural Research Station, Palur, South Arcot district. | 14th February 1959.                    | 873 17 371 50 Festival advance given to mazdoors | 1954-56                                                  | ..                                           | The Deputy Director of Agriculture, Madras has been asked to frame charges against officers and subordinates concerned in the case, obtain the explanations and submit them to this Office for passing final orders. The Deputy Director of Agriculture has sent only the explanation of the officers concerned. The explanations of the rest of the delinquents are being called for from him. He has also lodged a complaint with the police against the clerk concerned. The progress of the case is awaited. | ..                                                                      | ..       |
| 19            | 1959—1 ..                                                                                | Srikali Agricultural Depot, Thanjavur division.             | 5th February 1959.                     | 4,916 52                                         | ..                                                       | ..                                           | A sum of Rs. 2,273-05 nP. was immediately remitted by the Depot clerk. On verification of records it was found that a sum of Rs. 1,334-73 nP. need                                                                                                                                                                                                                                                                                                                                                               | ..                                                                      | ..       |

APPENDIX No. 30—cont.

Statement showing the cases of defalcations, etc., for the period from 1st July 1959 to 30th June 1960—cont.

| Serial number. | Number of cases of defalcations etc., pending at the beginning of the year under report. | The place of occurrence. | When the irregularities were detected. | Amount involved. | For what period the irregularities were kept unremedied. | Number of cases disposed of during the year. | Nature of action taken against the persons responsible.                                                                                                                                                                                                                                                                                                                                                                                                                            | Number of new cases detected during the year with details of the cases. | Remarks.                                                                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------|--------------------------|----------------------------------------|------------------|----------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)            | (2)                                                                                      | (3)                      | (4)                                    | (5)<br>RS. M.P.  | (6)                                                      | (7)                                          | (8)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (9)                                                                     | (10)                                                                                                                                                                                                                                        |
| 20 1959        | ..                                                                                       | Kolayanoor depot.        | 1959 ..                                | 1,658 68         | ..                                                       | ..                                           | not be recovered on account of adjustment effected or to be effected for articles issued as loan under Filter Point Scheme etc. A sum of Rs. 268-80 nP., is still to be recovered. The balance of amount has been duly accounted subsequently. The depot clerk is under suspension and charges framed against him have not yet been disposed of. Disciplinary action has also been initiated against the Extension Officer for Agriculture. Final orders have not yet been passed. | ..                                                                      | Shortages in stock amounting to Rs. 1658-68 and misappropriation was noticed during Physical verification of the depot. The Collector of South Arcot has placed the Extension Officer for Agriculture Sri B. Govindarajan under suspension. |

Disciplinary action against the subordinate has been initiated and is separately under consideration. The Depot clerk was placed under suspension and his service dispensed with. Action is reported to be taken by the Block Development Officer, Koliyanur, on the deficits noticed during physical verification. On receipt of a telegram received from the Block Development Officer, stating that Sri N. G. Raj, Agricultural Extension Officer, Andipatti, died by taking poison on 28th August 1959, the District Agricultural Officer, rushed to the spot at Periakulam when the Agricultural Extension Officer died and conducted detailed verification of stores and dead stocks on 30th August 1959. The value of loss of stocks, etc., was ascertained to be Rs. 2,821-11-0. Further investigation was taken up, certain items have been traced and recoveries effected. The loss is reported to have been brought down to Rs. 1,956.89. Expeditious action is being taken.

|         |    |                                              |                    |                                                       |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |    |    |
|---------|----|----------------------------------------------|--------------------|-------------------------------------------------------|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| 21 1959 | .. | Andipatti ..                                 | 30th August 1959   | 2,821 11                                              | .. | .. | Disciplinary action against the subordinate has been initiated and is separately under consideration. The Depot clerk was placed under suspension and his service dispensed with. Action is reported to be taken by the Block Development Officer, Koliyanur, on the deficits noticed during physical verification. On receipt of a telegram received from the Block Development Officer, stating that Sri N. G. Raj, Agricultural Extension Officer, Andipatti, died by taking poison on 28th August 1959, the District Agricultural Officer, rushed to the spot at Periakulam when the Agricultural Extension Officer died and conducted detailed verification of stores and dead stocks on 30th August 1959. The value of loss of stocks, etc., was ascertained to be Rs. 2,821-11-0. Further investigation was taken up, certain items have been traced and recoveries effected. The loss is reported to have been brought down to Rs. 1,956.89. Expeditious action is being taken. | .. | .. |
| 22 1960 | .. | Timchirappalli (Pumping and Boring Section.) | During March 1960. | Audit is in progress. Exact loss is not yet assessed. | .. | .. | The Subordinate concerned is absconding from duty. Police have been asked to comprehend him. Investigation is in progress and has not yet been completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | .. | .. |

## APPENDIX No. 31.

Statement showing the expenditure and receipts of the Agricultural Research Stations during 1959-60.

| Name of the agricultural stations.<br>(1)           | Expenditure.<br>(2) |     | Receipts.<br>(3) |     |
|-----------------------------------------------------|---------------------|-----|------------------|-----|
|                                                     | RS.                 | NP. | RS.              | NP. |
| Agricultural Research Station, Palur .. ..          | 49,189              | 83  | 42,307           | 52  |
| Rice Research Station, Tirur .. ..                  | 49,605              | 00  | 20,084           | 00  |
| Agricultural Research Station, Tindivanam .. ..     | 73,381              | 00  | 14,817           | 00  |
| Agricultural Research Station, Aduthurai .. ..      | 67,092              | 00  | 45,187           | 04  |
| Agricultural Research Station, Pattukkottai .. ..   | 43,106              | 79  | 15,693           | 92  |
| Agricultural Research Station, Koilpatti .. ..      | 50,551              | 19  | 14,395           | 92  |
| Agricultural Research Station, Nanjanad .. ..       | 84,731              | 63  | 37,088           | 01  |
| Agricultural Research Station, Bhavanisagar .. ..   | 88,266              | 23  | 64,748           | 93  |
| Banana Research Station, Aduthurai .. ..            | 39,246              | 72  | 12,967           | 00  |
| Central Sugarcane Research Station, Cuddalore .. .. | 1,57,807            | 08  | 81,370           | 17  |
| Central Farm, Coimbatore .. ..                      | 95,298              | 33  | 56,000           | 46  |
| Botanical Gardens, Ootacamund .. ..                 | 24,792              | 33  | 14,760           | 79  |
| Sim's Park, Coonoor .. ..                           | 10,387              | 49  | 11,417           | 17  |
| Pomological Station, Coonoor .. ..                  | 7,798               | 00  | 10,456           | 00  |
| Fruit Research Station, Kallar .. ..                | 9,309               | 00  | 14,151           | 00  |
| Fruit Research Station, Burliar .. ..               | 5,584               | 00  | 17,914           | 00  |
| Groundnut Research Station, Pollachi .. ..          | 17,080              | 89  | 187              | 13  |
| Rice Research Station, Ambasamudram .. ..           | 20,673              | 00  | 10,682           | 77  |
| Agricultural Research Station, Paramakudi .. ..     | 14,462              | 52  | 3,164            | 65  |

## APPENDIX No. 32.

Statement showing the results of analysis of experiments conducted on Paddy I, II and III crops and combined paddy during the fasli 1369 (1959-60) in Madras State.

| Category of experiment.<br>(1) | Number of experiments.<br>(2) |                                 | Estimated average yield in<br>(4) |                  | Percentage sampling error.<br>(6) | Production in at<br>(7) |                      |
|--------------------------------|-------------------------------|---------------------------------|-----------------------------------|------------------|-----------------------------------|-------------------------|----------------------|
|                                | Planned.<br>(2)               | Considered for analysis.<br>(3) | lb./acre.<br>(4)                  | kg./hect.<br>(5) |                                   | '00 ' tons.<br>(7)      | '00 ' tonnes.<br>(8) |
| Paddy I crop ..                | 794                           | 632                             | 1,251                             | 1,402            | 1.98                              | 24,360†                 | 24,751†              |
| Paddy II crop ..               | 222                           | 141                             | 1,360                             | 1,524            | 3.75                              | 7,730†                  | 7,854†               |
| Paddy III crop ..              | 24                            | 11                              | 1,092                             | 1,224            | 16.56                             | 440†                    | 447†                 |
| Paddy (combined) ..            | 1,040                         | 785                             | 1,273                             | 1,427            | 1.75                              | 32,530†                 | 33,052†              |
| Irrigated cumbu ..             | 108                           | 40                              | 879                               | 985              | .. *                              | .. *                    | .. *                 |
| Unirrigated cumbu ..           | 750                           | 166                             | 364                               | 408              | .. *                              | .. *                    | .. *                 |
| Irrigated cholam ..            | 178                           | 17                              | 1,241                             | 1,391            | .. *                              | .. *                    | .. *                 |
| Unirrigated cholam ..          | 560                           | 150                             | 376                               | 421              | .. *                              | .. *                    | .. *                 |
| Irrigated ragi ..              | 398                           | 114                             | 1,273                             | 1,427            | .. *                              | .. *                    | .. *                 |
| Unirrigated ragi ..            | 250                           | 74                              | 458                               | 513              | .. *                              | .. *                    | .. *                 |

\* The yield figures were not made use of for estimating the production in the case of millets as the percentage of completion of these experiments was very low.

† The production estimates for Paddy are provisional since the acreage figures are subject to revision, when final figures as per Season and crop report for the year 1959-60 become available.

## APPENDIX No. 33.

Statement showing the results of analysis of experiments conducted on paddy with three principal Green Manure Food aids during the fasli 1369 (1959-60) in Madras State.

| Category of experiment's.<br>(1) | Number of experiments.<br>(2) |                                 | Estimated additional yield in<br>(4) |                  | Percentage sampling error.<br>(6) |
|----------------------------------|-------------------------------|---------------------------------|--------------------------------------|------------------|-----------------------------------|
|                                  | Planned.<br>(2)               | Considered for analysis.<br>(3) | lb./acre.<br>(4)                     | kg./hect.<br>(5) |                                   |
| Improved seeds ..                | 250                           | 105                             | 279                                  | 313              | 9.22                              |
| Green manure ..                  | 250                           | 84                              | 267                                  | 299              | 9.53                              |
| Ammonium sulphate ..             | 250                           | 98                              | 354                                  | 397              | 9.41                              |

## APPENDIX No. 34.

Programme of work for 1960-61.

I. Paddy—(1) *Purline selection*.—Pure line selection work will be continued in the following varieties, namely, Tiruchengode samba at Coimbatore, Mattakuruvai at Aduthurai, Mattakuruvai, Kattaivellai, Kodaivellai, Kaivarisamba and some of the minor varieties grown in the coastal taluks at Pattukkottai, Vadam Samba, Kappa Samba, Chinna Samba, Kappakur, Mottakar, Kesari at Tirurkuppam, Sornavari, Thillainayagam, Seevan Samba, Thuyamalli Samba, Mottakar and Vellaikar at Palur, Maikuruvai Seenganni, Sembuli and Arikiravi at Ambasamudram and Kuliadichan, Pulithipiratti, Banku and Ramathapuram varieties at Paramakudi. A total of 49 promising cultures derived from 13 varieties will be under trial in cultivators' field in the different districts of Thanjavur, South and North Arcot, Chingleput, Ramanathapuram and Tirunelveli.

(2) *Hybridisation*.—(1) The japonica x indica hybrid progenies which were under trial at Coimbatore, Aduthurai, Palur, Ambasamudram and Tirurkuppam will be further tested. A total of 115 pure breeding cultures and 263 segregating progenies is available for yield trials and purification, respectively.

(2) Study of 16 cultures obtained from crosses between local varieties and some of the strong straw types of Chinese, Japanese and Australian origin will be continued and they will be compared for yield with their standards, both on the stations at Coimbatore, Aduthurai and Tirurkuppam and on the ryots' holdings. Further selection work will be continued from the 166 segregating progenies available.

(i) Specific crosses to combine useful characters—

(a) The season and period bound progenies, eleven in number, will be tested in the districts to evolve a cosmopolitan strain. The work will be pursued at Coimbatore and Tirurkuppam.

(b) To combine the bunchy panicle and five grain characters of the Bombay types, Kolamba and Zinnia, with the profuse tillering habit of GEB. 24, 24 progenies will be studied and the most promising one fixed up as a strain.

(c) The quality improved work in Co. 23 will be continued with the three promising cultures available.

(d) Four cultures of the crosses ADT. 17 x Co. 19 and PLR. 1 x Co. 19 to improve the panicle character of Co. 19 will be tried in the districts.

(e) To evolve a cosmopolitan strain and to reduce the number of strains, 13 promising cultures derived from four sets of crosses will be tried in the districts while six from Co. 23 x T. 672 will be tested for yield against Co. 23 on the farm.

AGRI.—33A

(f) The hybrid progenies of crosses between ADT. 16 and GEB. 24 to induce non-shattering habit in ADT. 16 will be studied at Aduthurai and yield trials will be conducted with the 13 homozygous cultures.

(g) Replicated yield trials with the progenies obtained from crosses between ADT. 15 and ASD. 8 and CH. 2 x ADT. 3, will be laid out at Pudukkottai to fix up cultures with shorter duration and cultures with bunched panicle and non-lodging characters respectively.

(h) A total of 72 segregating progenies obtained from cross Co. 10 x Burma types will be further sifted for purity and non-lodging character, at Tirurkuppam.

(i) Quality improvement work in PLR. 1 will be continued at Palur by repeating the yield trial with six promising cultures from the cross PLR. 1 x Co. 19.

(j) The district trials under scattered blocks will be continued with the two cultures, one in each of Co. 14 x Co. 8 and GEB. 24 x PTB. 15, for evolving a high yielding strain for Pishanam season in Tirunelveli district.

(k) Fresh crosses will be effected to induce non-shedding habit in ASD. 1, non-lodging habit on ASD. 1, to improve the grain quality of Co. 25 and to increase the yield of ASD. 5 with suitable parents at Coimbatore and other centres.

(3) *Introduction.*—Study of the world collection of types and varieties will be continued to ascertain the suitability of any of them either for direct introduction or for use as parents in hybridization work. The district trials with the three short duration Chinese types will be continued. The variety from Madhya Pradesh, Labhandi, will be tried for yield in the coming season. Besides, trials with outstation similar duration strains will be continued in all the research stations to fix up the cosmopolitan ones.

(4) *Induction of mutations.*—The economic mutants obtained treating seeds with chemicals and X-ray will be multiplied for conducting district trials.

(5) *Manurial experiments.*—The following manurial trials will be conducted at different centres:—

(i) Permanent manurial experiments at Aduthurai and Palur.

(ii) Varietal response to manuring at Coimbatore, Aduthurai, Pattukkottai, Palur, Tirurkuppam and Ambasamudram.

(iii) Fractional application of ammonium sulphate at Coimbatore, Aduthurai, Pattukkottai, Palur, Tirurkuppam and Ambasamudram.

(iv) Hyper phosphate experiment at Tirurkuppam.

(v) Time of application of nitrogen to short-term paddy of 100 days' duration at Aduthurai and Ambasamudram.

(6) *Cultural experiments.*—(i) Dibbling seeds adopting different spacings at Tirurkuppam.

(ii) Seed rate in broadcast crop of paddy at Tirurkuppam and Paramakudi.

(iii) Summer ploughing experiment at Ambasamudram.

(7) *Miscellaneous experiments.*—Presoaking of seeds with sodium bicarbonate solution experiments at Coimbatore, Aduthurai and Palur.

(8) *Schemes financed partly by the Indian Council of Agricultural Research.*—(i) *Evolution of superior blast resistant strains.*—Testing of hybrid progenies for resistance and purity, conducting yield trials and district trials with homozygous cultures, study of types to fix up resistant ones for future hybridization work and study of the relation between time of planting and disease incidence will be carried out at the two centres, viz., Coimbatore and Aduthurai.

(ii) *Evolution of drought resistant strains.*—The work will be carried out at two centres, Coimbatore and Tirurkuppam. The trials of the large number of hybrid progenies, collecting and testing of drought resistant varieties both within and outside the State and country, study of the root system of the different varieties to find out the correlation between the root system and drought resistance and the study of size and number of stomata in the leaf, stem and sheath of rice varieties are the items of work proposed to be done next year.

(iii) *Evolution of superior short-term strains of paddy possessing seed dormancy.*—The items of work will consist of laying out comparative yield trials with the promising cultures, sifting of segregating progenies with the desirable characters, study of the short-term types in germplasm bank to spot out useful ones and the study of the physiological aspects of seed dormancy. The main work will be carried out at Coimbatore and Aduthurai.

(iv) *Evolution of strains for inundated areas.*—The work at the Deep Water Rice Research Station, Talainayar, will consist of conduct of yield trials with the available promising pureline cultures and study of the large number of hybrid progenies under typical inundated conditions.

(v) *Evolution of saline and alkaline resistant paddy strains.*—The studies at the newly opened Saline Rice Research Station, Peravurni, will include testing of the varieties reputed to be resistant to saline and alkaline conditions, collected from different parts of the State, country and the world, screening the existing population of hybrid progenies for saline resistance and study of some physiological and anatomical characters that may have relationship to saline resistance.

## II. Millet and Pulses—Millet Breeding Station, Coimbatore—Cholam—

### (1) *Rainfed Cholam*—

(i) Periamanjil Cholam (*Sorghum durra* var. Coimbatorem) improving the quality of straw hybridization;

(ii) Talaivirichan Cholam (*Sorghum roxburghii* var. Hians)—

(a) Improvement of grain yield.

(b) Improvement of grain size and fodder quality of Talaivirichan Cholam.

(iii) Irungu cholam (*Sorghum dochna*) Improvement of quality of fodder.

(2) *Irrigated Cholam.*—(i) *Sen Cholam* (*Sorghum subglabrescens* var. *rubidum*) Evolution of a high yielding juicy stalked Sen Cholam selection.

(ii) Evolution of a high yielding pink grain strain.

(iii) Vellai Cholam (*Sorghum subglabrescens*) Evolution of a high yielding strain with juicy stalks and pure white grains.

(iv) Evolution of a strain with bold white pearly grains free from wash.

(3) Exploitation of hybrid vigour (irrigated cholam).

(4) Evolution of a non-lodging leafy type of white grained *Sorghum* with straight peduncles and high yield.

(5) Revival of types.

(6) Studies on the genus *sorghum*-awn.

*Cumbu.*—A. Maintenance of germ plasm bank.

B. *Testing of hybrids.*—(a) Studies on the performance of synthetic varieties.

(b) Study of Poly-cross for choice of inbreds for producing synthetics.

*Ragi.*—(1) *Evolution of a high-yielding short duration (90 days) Ragi strains*—

(a) By selection.

(b) By hybridization.

(2) Evolution of a high-yielding non-lodging short duration strains of ragi.

(3) Evolution of high-yielding white grained Ragi strains having high protein and vitamin content by hybridization.

*Tenai and minor millets.*—(1) (a) Evolution of rust resistant strains of Tenai.

(b) Maintenance of germ plasm bank in minor millets.

**Pulses—A. General pulses.—(a) Maintenance of germ plasm bank.**

**B. Redgram.—(a) Evolution of high-yielding strains (long duration).**

**(b) Short duration Redgram—Evolution of high-yielding strains by—**

**(i) Selection.**

**(ii) Hybridization.**

**C. Greengram.—Evolution of high-yielding strains in dryland Greengram.**

**D. Blackgram.—Evolution of high-yielding strains of dryland Blackgram.**

**E. Clusterbeans.—Evolution of vegetable and seed types.**

*Agricultural Research Station, Koilpatti.*

**Millets—(1) Cumbu (*Pennisetum typhoides*) Rainfed.—Exploiting hybrid vigour for economic purposes.**

**(2) Irungu Cholam (*Sorghum dochna*) Rainfed.—To evolve a grain-cum-fodder strain with bold grains suited to the southern districts.**

**(3) Vellai Cholam (*Sorghum subglabrescens*) irrigated.—**

**(i) To evolve a strain better than K.2 Cholam.**

**(ii) Improving the fodder quality of Vellai Cholam strain K. 2.**

**(4) Ragi (*Eleusine Coracana*) irrigated.—Isolation of high-yielding short duration ragi strain.**

**(5) Minor Millets (*frumentacea*) Rainfed.—Improvement of Kudiraivali, the important minor millet of the tract—**

Scheme for the evolution of new varieties of dryland lab-lab bushy in habit, with prolific yield of superior quality of edible pods—

**(1) Collection and maintenance of types.**

**(2) Evolution of high-yielding strains of field and garden varieties of lab-lab.**

**(3) Evolution of high-yielding strains of lab-lab bushy in habit, prolific in yield and superior in quality of edible pods by hybridization.**

**(4) Improvement of selection D.L. 1428.**

**Oilseeds—I. Groundnut.—(1) Strains received from other States and foreign countries and promising selections already, raised in the section will be studied in greater detail for finding out their suitability to the different tracts in the State.**

**(2) District trials of all the promising selections will be continued.**

**(3) Hybridization work in main section and in the scheme for intensive breeding of groundnut and the study of progenies of crosses will be studied with the view to evolve economic varieties possessing desirable characters.**

**(4) Evolution of a high yielding bunch selection suited to Pollachi tract.**

**(5) Studies on physiological aspects of groundnut such as Nutrition, the important minor millet of the tract—**

**(6) Manurial, cultural, spacing and rotation experiments will be pursued further.**

**II. Gingelly.—(1) New varieties from other States and countries will be collected and tested.**

**(2) District trials of all the selected varieties will be continued.**

**(3) Hybridization work to evolve (a) a white seeded strain, a cosmopolitan type a type resistant to 'shoot webber' pest will be taken up.**

**(4) Manurial and cultural trials will be repeated for obtaining conclusive results.**

**(5) Investigation envisaged in the scheme for intensive breeding of sesamum will be carried out in full.**

**III. Castor.—(1) The promising selections made so far will be tested under comparative yield trial, preliminary yield trial compact family block trials and replicated row tests.**

**(2) Heterosis—the study of five hybrids in replicated row trials and compact family block and comparison of naturally cross fertilized seeds with artificially cross-fertilized seeds obtained from hybrids, will be carried out.**

**(3) The investigations envisaged in the scheme for production of hybrid castor will be carried out.**

**IV. Coconut.—The items of investigations envisaged in the technical programme of the scheme for establishment of a Regional Coconut Research Station will be carried out.**

**Cotton.—The following items of fundamental and breeding problems will be tackled by research as per the three-year programme of work:—**

**I. Fundamental—**

**1 Perennial cotton.**

**2 Utilization of wild germplasm.**

**3 Synthesising Asiatic and American cottons.**

**4 Germination and seed viability studies.**

**5 Breeding for marker gene.**

**6 Yard stick studies.**

**7 Vicinism studies.**

**8 Inheritance of characters.**

**9 Heterosis.**

**10 Cytogenetic Investigation.**

**11 Study of Megasporogenesis and Megagametogenesis.**

**12 Cultural response to varying levels of fertility.**

**13 Devising simple and inexpensive instruments.**

**14 Germplasm bank.**

**15 Experiment on effect of varying interval between irrigation and plant protection schedules.**

**II. Breeding—**

**16 Breeding of winter cambodia regions in Madras State under one adaptable American cotton superior in yield and quality to the existing growth.**

**17 Varietal trials with desi and American cottons for the Bhavani Project area at the Agricultural Research Station, Bhavanisagar.**

**18 Time of sowing trials with 9030 G. at Bhavanisagar.**

**19 Breeding for an extra long staple cotton at Srivilliputhur.**

**20 Improvement in yield and quality of unirrigated cotton in Madras State.**

**Horticulture—(1) Pomological Station, Coonoor—Programme for 1960-61.—(i) Introduction and trial of new kinds and varieties of fruits and other horticultural crops.**

**(ii) Continuance of rootstock trials in apple, plum and peach.**

**(iii) Propagation studies in persimmon.**

**(iv) Comparison performance between grafts and seedlings of cherimoyer.**

**(2) Kallar and Burlar Fruit Stations—Programme for 1960-61.—(i) Introduction and study of various kinds of fruits and other economic crops; (ii) study and description of individual progenies of citrus, jack, annona hybrids, citrus hybrids, etc.; (iii) hybridization in pineapple; (iv) rootstock trial in citrus, annona, jack and durian.**

**(3) Agricultural Research Station, Nanjanad—Programme for 1960-61.—(1) Manurial experiments.—(i) Studies on the comparative merits of the different**



green manures; (ii) studies on the interaction between the quantity of fertilizer applied and seed size; (iii) studies to evaluate the optimum fertilizer requirements of a few popular potato varieties.

(2) *Cultural experiments*.—(i) Depth of cultivation; (ii) studies on the effect of various inward slopes; (iii) studies on the effect of mixed cropping.

(3) *Miscellaneous experiments*.—(i) Varietal studies; (ii) studies on the effect of maleic hydrazide; (iii) studies on the effect of leaf roll and mosaic diseases.

(4) *Botanic Gardens, Ootacamund and Sim's Park, Coonoor—Programme for 1960-61—Government Botanic Gardens, Ootacamund*.—(i) Plant introduction studies, (ii) viability studies in seeds of annuals and trees, (iii) study of growth and flowering in orchids, (iv) selection and seed or plant multiplication of *Amaryllis* and *Begonias*.

*Sim's Park, Coonoor*.—(i) Plant introduction studies, (ii) viability studies in seeds of annuals and trees, (iii) Basic information on growth and flowering in selected plants, (iv) selection and seed or plant multiplication of *Amaryllis* and *Begonias*.

(5) *College Orchard, Agricultural College and Research Institute, Coimbatore—Programme for 1960-61*.—(i) Study of regional performance of grape varieties, (ii) study of water requirements of grape and papaya, (iii) hybridization in papaya, (iv) Papaya improvement, (v) Pruning and notching trial in different varieties of figs, (vi) Studies on papain extraction, (vii) monthly pruning trial in Bangalore Blue grape, (viii) study of new introductions and established economic species of horticultural crops, (ix) Raisin making trials with grape varieties.

(6) *Scheme for research on clove, nutmeg and cacao—Programme for 1960-61*.—(i) Studies on clonal progenies in clove, nutmeg and cacao, (ii) investigation to determine the differences between current season's sucker shoots and terminal shoots in clove, (iii) propagational trials in clove, (iv) trial on rooting of semi-hard wood cuttings with hormone treatment in nutmeg, (v) Rootstock trial in nutmeg, (vi) studies on rooting of cuttings and determination of suitable shade plants, optimum pruning treatments and curing methods in cacao.

(7) *Vegetable scheme, Coimbatore—Programme for 1960-61*.—(i) Comparative yield trials in brinjal, bhendi and tomato, (ii) hybridization studies in brinjal and radish, (iii) hybrid vigour studies in brinjal and bhendi, (iv) blossom biological studies in snake gourd.

(8) *Tuber Crop Scheme, Coimbatore—Programme for 1960-61*.—The scheme was closed down on 30th September 1960. The planting materials of superior types in both tapioca and sweet potato are under multiplication and distribution. The cultures of the different varieties in both the crops are being maintained at the College Orchard, Coimbatore.

(9) *Banana Research Station, Aduthurai—Programme for 1960-61*.—(i) Studies on varieties of banana cultivation, (ii) hybridization, (iii) Mutants and selections, (iv) trial on rotation, desuckering, manuring, irrigation, spacing, etc., and (v) fundamental studies on banana root systems, fruit development and suckering habits in different varieties.

(10) *Fruit Research Station, Periyakulam—Programme of work for 1960-61*.—(i) Varietal studies with mango, citrus, grape,

(ii) Rootstock trials in mango and citrus,

(iii) Manurial trial in mango, citrus and grape.

(iv) Studies on blossom biology and off-season bearing in mango.

(v) Study of bud sports in citrus.

(vi) Trial in orchard cultural practices and collection of nucellar seedlings in citrus.

(vii) Irrigation trial in grapes.

(viii) Studies on thinning of grapes.

(ix) Study of economics of cultivation in mango, citrus and grape.

*Central Sugarcane Research Station, Cuddalore.*

(a) *Agronomy*—

1 Varietal study.

2 Preliminary yield trial of early and late varieties.

3 Main yield trial of early and late varieties.

4 Maturity observation of early and late varieties.

5 Adsali varietal trial.

6 Response of sugarcane to phosphates.

7 Alternate source of nitrogen.

8 Nitrophosa observation plot.

9 Propping trial.

10 Testing of Hawaiian features in the Main and Adsali Season.

11 Investigation of optimum dose and number of split doses to be given to Adsali crop.

12 Study of effect of hormones as pre-harvest spray on sugar content of cane.

13 Studies on deterioration in cane varieties.

14 Root studies.

15 Weedicide trial for control of weeds.

16 Mulching trial.

17 Germination studies.

18 Studies on the seed and utility of bulky organic manure as basal dose.

(b) *Chemistry*—

1 Nutrition of sugarcane.

2 Foliar application of nitrogenous manure to sugarcane.

3 Studies on moisture index, vegetable index and prediction of response of sugarcane to nitrogen manuring.

4 Study of total solids—Sucrose relationship in sugarcane.

(c) *Entomology*—

1 Study of sugarcane borers—Assessing incidence conducting insecticidal trial, biological studies, studies on natural enemies and alternate hosts.

2 Termite studies.

3 Studies on white-fly.

4 Studies on cane-fly and other pests.

(d) *Mycology*—

1 Rice blast (*Piricularia oryzae*).

2 Fungicidal trial against pineapple disease.

3 Varietal resistance to mosaic.

4 Varietal resistance to wilt.

5 Studies on other diseases.

*Mycology Section*—

1 Rice blast (*Piricularia oryzae*).

2 Helminthosporiose of paddy.

3 Ragi blast (*Piricularia* sp.).

4 Green ear ofumbu.

5 Seed borne fungi of cereals.

6 Black arm of cotton (*Xanthomonas malvacearum*).

7 Alternaria leaf spots of solanacea.

8 Anthracnose of leguminosae (*Collectotrichum* and *Gloeosporium* spp)

9 Brown rot of potato (*Xanthomonas solanacearum*).

- 10 Banana wilt (*Fusarium oxysporum* var. *cubense*).
- 11 Banana anthracnose.
- 12 Ganoderma wilt of coconut.
- 13 Virus diseases of pulses crops.
- 14 Studies of pythiaceous fungi.
- 15 Studies on the factors affecting nodule development and fixation of nitrogen by certain legumes.
- 16 The survey of the microflora of the soils of Madras State.
- 17 Investigation of the Potentialities of indigenous material for control of diseases.
- 18 Devising suitable and cheap equipment for laboratory use.

*Indian Council of Agricultural Research Schemes.*

- 1 Research on fungicides.
- 2 Study of Nitrogen fixing blue green algae in rice soils.
- 3 Investigation of stem rot diseases of rice in Madras State.
- 4 Investigation of Betelvine wilt in Madras State.
- 5 Investigation of Banana diseases in Madras State.

*Programme of work for 1960-61.*

**Entomology Section.**

**I. Pests of rice—**

(1) The rice bug (*Leptocoris acuta* Th.). Studies on the life history with reference to seasonal factors, alternate hosts, natural enemies and insecticidal measures of control with new insecticides such as Aldrin and Dieldrin, etc., will be taken up.

**II. Pests of millets—**

(2) Cholan stem borer: (*Chilo zonellus* S.). Continuation of the current year's experiments. Sprays of Folidol, Endrin, Aldrin, Dieldrin will be tried and studies on bionomics continued.

**III. Pests of cotton—**

(3) The leaf roller. (*Sylepta derogata* F.). Potentialities of the new chemicals will be studied.

**IV. Pest of oil-seed—**

(4) The Castor semilooper (*Achoea janata* L.). Investigations on the control of the pest with various chemicals such as Aldrin, Dieldrin, Folidol and Basudin to be taken up.

(5) The Castor aleurodid (*Trialeurodes ricini* M.). Studies on the life history, alternate host, natural enemies and, control measures with new chemicals to be pursued.

(6) The castor shoot and pod borer (*Dichocrocis punctiferalis* G.). Investigations on the period of occurrence, the extent of damage, alternate host, etc., to be continued. Insecticidal trials to assess the efficacy of the chemicals against the pest will be continued.

(7) The red hairy caterpillar on groundnut (*Amsacta albistriga* M.). Studies on the usefulness on the recent chemicals in controlling the pest will be undertaken.

**V. Pests of fruits—**

(8) The fruit sucking moths of citrus (*Othreis* spp.). Investigation to evaluate the effectiveness of the synthetic chemicals in controlling the pests will be carried out.

(9) Studies on the teamosquito bug on guava (*Helopeltis antonii* S.). Studies on an observational basis will be conducted to evolve suitable control measures.

(10) Tapioca scale (*Aonidomytilus albus* Ckll.). Intensive studies will be taken up on the life history and suitable control measures will be attempted to be evolved.

(11) Sweet potato weevil (*Cylas formicarius* F.). Investigations will be pursued to find out the optimum number of insecticidal applications as foliar sprays or soil application necessary to give maximum control of the pest.

**VI. Soil insecticides—**

(12) Control of chafer grubs. To study the bionomics of the pest and the extent of damage caused by them. The usefulness of different insecticides as soil applications will also be taken up.

**VII—**

(13) Pests of stored products. Studies on the correlation between the insect infestation and moisture content will be continued.

(14) Fixing up a schedule of treatments against pests of paddy. Field experiments will be continued to arrive at a suitable prophylactic schedule of treatments necessary to give relief against all the pests of paddy.

(15) Fixing up a schedule of treatments against pests of cotton. Work on the above lines with reference to cotton pests will also be continued.

(16) Studies on mites as crop pests. Information on the biology of mites and their control will be gathered.

(17) Biological control: Studies on some indigenous coccinellids. Studies on the potentialities of the indigenous coccinellids in the field of biological control will be continued.

(18) Economic aspects of earthworm. Investigations on the usefulness of earthworms in enriching the soil will be continued.

(19) Insecticidal properties of some indigenous poisonous plants. Studies on the insecticidal properties of various plants will be continued with a view to explore the possibilities of utilizing them in the control of insect pests.

(20) Adverse effects of insecticides. Studies on the adverse effects of pesticides on various groups of plants will be continued.

(21) Bee-keeping. Investigations on the possibilities of improving the honey yielding capacity of the Indian honey bee by (a) selective breeding, (b) methods of swarm control and (c) different types of hives will be continued.

(22) Systematics. The rearrangement and systematic reclassification of the insects will be continued.

**VIII. Fundamental Items—**

(23) Bionomics of important coccinellids predaceous on aphids and scales. Studies on *Clanis pubescens* M and *Scymnus nubilus* M will be continued.

(24) Pests of tamarind. Studies on the seasonal incidence and bionomics and control of the pests affecting the tamarind will be pursued.

(25) Pests of roses. Work on the above lines with reference to roses will be continued.

(26) Pests of pulses. Studies on the bionomics and morphology on the major pests affecting pulses will be continued.

(27) Hairy caterpillars of economic importance. Work on the above lines with reference to important hairy caterpillars, viz.:—

- (i) *Amsacta albistriga* M,
- (ii) *Eupterote mollifera*,
- (iii) *Euproctis fraterna* M,
- (iv) *Perina nuda* F; and
- (v) *Orgyia postica* W will be continued.

(28) Pests of cruciferous vegetables. The bionomics and control of various pests, affecting the cruciferous vegetables will be studied.

(29) Pests of green manure crops. Studies on *Cyclopelta sicifolia* W and *Asphondylia* sp. and other pests affecting *Gliricidia* and *Sunn hemp* will be continued.

## IX. Post-Graduate research—

(a) Studies on systemic insecticides.

(b) Studies on some South Indian Weevils. Work on these items will be carried out by Sri K. R. Nagaraja Rao and Sri T. R. Subramaniam respectively for the Ph.D. Degree.

## B. Schemes—

(1) The Paddy Stemborer Scheme, Aduthurai.

(2) Scheme for research on toxicology and adverse effects of synthetic pesticides.

(3) Vegetable pests. These three schemes are financed by the Indian Council of Agricultural Research and the work will be carried out as per the technical programme.

(4) Sugarcane insect pests scheme. Scheme financed by the Indian Central Sugarcane Committee and the work will be carried out on the items chalked out in the technical programme.

*Programme of work for 1960-61.*

## (Soil Science Section.)

The work on (1) effect of indigenous soil conditioners like tamarind seed, saw dust, paddy husk, etc., on the different soil types of Madras State.

(2) Effect of different cations on the physico chemical properties of the major soil types of Madras State.

(3) Estimation of inorganic ions in soil by paper chromatography.

(4) Anion exchange.

(5) Role of calcium in the fertility of South Indian Soil types.

(6) The permanent Manurial Experiments.

(7) Influence of Manuring on the quality of grains, and

(8) Correlation of the results of rapid soil testing methods with those of the traditional methods of soil analysis, will be continued during 1960-61.

Besides, the work under the Schemes (1) I.C.A.R. Scheme for the Reclamation of saline and alkaline lands, (2) I.C.A.R. Scheme for studies on the reversion of phosphates in the laterite soils in Nilgiris, (3) I.C.O.C. Scheme for research on the storage of seeds and cakes of groundnut, (4) Soil Testing Service, (5) Soil survey of the Amaravathi Project area and (6) Soil survey of the Parambikulam Upper Aliyar Project area, will be continued.

Work will also be taken up under any other scheme sanctioned and implemented during the period.

## Botany (Main).

1 Studies on introduction and acclimatisation of economic plants and their relatives.

2 Dormancy and viability of some South Indian vegetable seeds.

3 Pre-treatment of grass seeds for improving germination.

4 Germination studies in flowering annuals.

5 Studies on minor crops as Umbelliferous plants and Trigonella.

6 Longevity studies of seeds and propagules of weeds.

7 Induction mutation in the common flowering and foliage shrubs of the plains.

8 Exploitation of indigenous plant wealth.

## Cytogenetics.

9 Cytogenetical studies in (a) Cumbu and (b) Sorghum.

## Plant Physiology.

10 Foliar nutrition of crop plants with major nutrients.

11 Weed control by herbicides.

12 Studies with growth regulating chemicals.

13 Bud and boll shedding in cotton.

## AGRICULTURAL METEOROLOGY SECTION.

*Programme of work for 1960-61.*

1. The Meteorological and microclimatic observations will be recorded daily in the observatory and amidst the crops at stipulated hours.

2. Crop-weather experiments on cholam, cotton and paddy will be continued.

3. The available data on the weather and crops will be culled out from the Agricultural Research Station Reports and analysed statistically to study the influence of weather on the yields of crops, and incidence of pests and diseases.

4. The studies on the incidence of pests and diseases on the irrigated crops of cotton, cholam, groundnut and ragi, in relation to weather, will be continued in collaboration with the Government Entomologist and Government Mycologist, Coimbatore.

5. The studies on the crop-climate relationship of cholam crop will be continued.

6. Monthly weather reviews will be published in the Madras Agricultural Journal and Mezhielavam.

7. The scheme for the Broadcast of sudden changes in weather and their effects on crops will be implemented after getting an Assistant trained in Synoptic Meteorology.

8. Artificial Rain-making experiments will be continued at Coimbatore.

*General—Extension work.*—The Extension staff in the district will continue to concentrate their attention on the supplies and works schemes of the Intensive Cultivation Schemes under the Second Five-Year Plan. The campaigns of extension of the Sesbania Japanese method of rice cultivation, filter-point tube-wells, cotton and sugarcane development will be continued. Collaboration with Departments of Revenue, Co-operation, Animal Husbandry, Community Projects, National Extension Service Blocks will be maintained to ensure efficient progress. Agricultural Associations will be organized and all associations will be kept functioning. The extension staff in the districts will tour frequently and maintain close contact with farmers and carry out demonstrations, trials and advise them on all agricultural improvements. Preservation of cattle manure and preparation of compost will be demonstrated extensively. Use of urban compost will be popularized.

Trials of improved strains of paddy, millets, sugarcane, oil seeds, pulses, cotton, etc., will be continued. Supplies of seedlings, grafts, etc., of fruit plants, vegetables and subsidiary food crops will be maintained. State Seed Farms will be started for multiplication of improved strains.

*Bee-keeping.*—Bee-keeping will be extended and popularized in the districts.

Control of pests and disease of crops will be attended to in all the districts with the aid of the special staff and adequate stocks of pesticides and equipments will be maintained. Weekly forecasts on outbreak of pests and diseases will be continued to be issued.

*Cotton extension works.*—Comprising of introduction of improved varieties, manuring of irrigated cotton with ammonium sulphate, mixed cropping with chillies, groundnut and ragi, extending cotton cultivation in the rice fallows and control of pests and diseases will be continued to reach targets fixed under the Second Five-Year Plan.

*Vanamahotsava.*—This will be celebrated in all the districts in the first week of July along with Compost Week and Wild Life Day as usual and supply of seedlings. Cuttings and seeds of ornamental economic and other trees will be done on an extensive scale.



*Glossary—cont.*

|                      |    |                                 |                     |    |                                   |
|----------------------|----|---------------------------------|---------------------|----|-----------------------------------|
| Field beans ..       | .. | <i>Dolichos Lab Lab.</i>        | Sapota ..           | .. | <i>Achras Sapota.</i>             |
| Fig ..               | .. | <i>Ficus Carica.</i>            | Soya beans ..       | .. | <i>Glycine max.</i>               |
| Garlic ..            | .. | <i>Allium sativum.</i>          | Straw berries ..    | .. | <i>Fragaria vesca.</i>            |
| Gingelly ..          | .. | <i>Sesamum orientale.</i>       | Sugarcane ..        | .. | <i>Saccharum officinarum.</i>     |
| Ginger ..            | .. | <i>Zingiber officinale.</i>     | Sunn hemp ..        | .. | <i>Oreolaria juncea.</i>          |
| Gogu ..              | .. | <i>Hibiscus cannabinus.</i>     | Tamarind ..         | .. | <i>Tamarindus indica.</i>         |
| Grape fruit ..       | .. | <i>Citrus paradisi.</i>         | Tapioca ..          | .. | <i>Manihot utilissima.</i>        |
| Green gram ..        | .. | <i>Phaseolus aureus.</i>        | Tenai ..            | .. | <i>Setaria italica.</i>           |
| Groundnut ..         | .. | <i>Arachis hypogaea.</i>        | Teosinte ..         | .. | <i>Euchlaena mexicana.</i>        |
| Guava ..             | .. | <i>Psidium Guajava.</i>         | Tree tomato ..      | .. | <i>Cyphomandra betacea.</i>       |
| Guineagrass ..       | .. | <i>Panicum maximum.</i>         | Tobacco ..          | .. | <i>Nicotiana Tabacum.</i>         |
| Horse gram ..        | .. | <i>Dolichos biflorus.</i>       | Travellers' Tree .. | .. | <i>Ravennala madagascarensis.</i> |
| Indigo ..            | .. | <i>Indigofera sumatran?</i>     | Tungoil plant ..    | .. | <i>Aleurites fordii.</i>          |
| Jak ..               | .. | <i>Artocarpus integrifolia.</i> | Turneme ..          | .. | <i>Curcuma Longa.</i>             |
| Kikuyu grass ..      | .. | <i>Pennisetum clandestinum.</i> | Vavagu ..           | .. | <i>Paspalum scrobiculatum.</i>    |
| Kolinji ..           | .. | <i>Tephrosia purpurea.</i>      | Variga ..           | .. | <i>Triticum sp.</i>               |
| Killanggeru ..       | .. | <i>Ipomoea tilioides.</i>       | Wheat ..            | .. | <i>Eicchornia crassipes.</i>      |
| Kolukkattai grass .. | .. | <i>Cenchrus ciliaris.</i>       | Water hyacinth ..   | .. | <i>Tephrosia purpurea.</i>        |
| Korra ..             | .. | <i>Setaria italica.</i>         | Wild Indigo ..      | .. |                                   |

## FOOD AND AGRICULTURE DEPARTMENT

**G.O. No. 3339, 18th September 1961**

Administration Report—Agricultural Department—1959-60—  
Recorded with remarks.

**READ**—the following papers :—

Letter from the Director of Agriculture, No. G.3. Pdl. 88/60.  
dated 13th December 1960.

Government Memorandum No. 140376 B-III, Food and Agriculture, No. 60-12, dated 22nd August 1961.

**Order—No. 3339, Food and Agriculture, dated 18th September 1961.**

The report on the working of the Agricultural Department for the year 1959-60 submitted by the Director of Agriculture is recorded with the following remarks.

2. From the report submitted by the Director of Agriculture, it is observed that the audit parties have audited 232 offices and institutions out of 698 offices and institutions to be audited and that the offices audited by the Internal audit parties is considerably low being less than 35 per cent of the total offices to be audited by them. The Director of Agriculture is informed that the audit parties should audit at least once a year all the offices allotted to them for audit, so that the administrative and financial irregularities committed in those offices could be detected by the audit party in good time and brought to the notice of the officers who may then guard against such irregularities in future. The Director of Agriculture is requested to issue suitable instructions to the audit parties to audit all the offices allotted to them at least

once in a year and he is requested to submit proposals for additional audit parties, if necessary. The Director of Agriculture is also requested to take more sustained action for the early and expeditious settlement of all the pending audit objections.

3. *Crop Improvement work.*—The Director of Agriculture is requested to give comparative statements of yield per acre of each crop year by year for the immediately preceding three years in future reports.

4. *Conclusion.*—The report shows that the working of the Agricultural Department during the year under report was generally satisfactory.

(By order of the Governor)

V. VASUDEVAN,  
*Deputy Secretary to Government.*

