

AGRICULTURAL DEPARTMENT

ADMINISTRATION REPORT
OF THE
AGRICULTURAL DEPARTMENT
FOR THE FASLI 1370

For the period from 1st July 1960 to 30th June 1961

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GOVERNMENT OF MADRAS
1963

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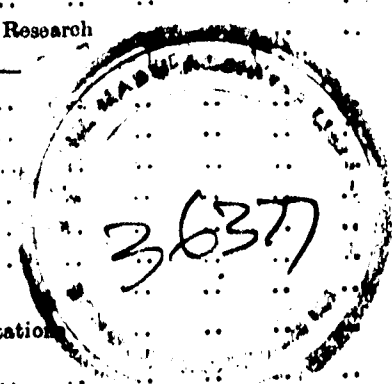
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ADMINISTRATION REPORT OF THE AGRICULTURAL DEPARTMENT FOR THE PERIOD FROM 1ST JULY 1960 TO 30TH JUNE 1961.

I. ADMINISTRATION.

Sri A. Venkatesan, I.A.S., continued as Director of Agriculture upto 16th November 1960.

Sri V. Karthikeyan, I.A.S., took charge on 17th November 1960 and continued to hold the post during the rest of the period under report.

The following officers were also holding the posts mentioned against each during the period under report :—

Sri C. R. Seshadri, Joint Director of Agriculture, Planning and Development—Throughout.

Sri M. Obeidullah Shah, Joint Director of Agriculture, State Seed Farm—Throughout.

Sri S. M. Sulaiman, Joint Director of Agriculture, Inspection and General—1st July 1960 to 28th February 1961.

Sri P. P. Syed Mohammed, Joint Director of Agriculture, Inspection and General-in-charge—1st to 30th March 1961.

Sri T. K. Thangavelu, Joint Director of Agriculture, Inspection and General—31st March to 30th June 1961.

Sri S. M. Sulaiman, Joint Director of Agriculture—Extension in-charge—29th July 1960 to 30th March 1961.

Sri P. P. Syed Mohammed, Joint Director of Agriculture (Extension)—29th July 1960 to 30th March 1961.

Sri T. K. Thangavelu, Joint Director of Agriculture (Extension in-charge)—31st March to 5th April 1961.

Sri T. Natarajan, Joint Director of Agriculture (Extension)—6th April to 30th June 1961.

Sri R. M. Chidambaram, Joint Director of Agriculture (Engineering in-charge)—1st to 10th July 1960.

Sri N. Sankaranarayana Reddy, Joint Director of Agriculture (Engineering)—11th July 1960 to 30th June 1961.

Sri T. K. Karunakaran, Accounts Officer—Throughout.

Sri K. S. Narasimha Mudaliar—Personal Assistant Director of Agriculture—Throughout.

The cadre strength of the Gazetted Post in the Agriculture Department, continued to be 64.

The following officers, were either on deputation or on foreign service, at the end of the period under report :—

(1) Dr. G. S. Siddappa, Permanent Bio-Chemist (Services lent to the Council of Scientific and Industrial Research, Government of India, for appointment as Senior Scientific Officer, Central Food Technological Research Institute, Mysore).

(2) P. S. Krishnamurthy, approved probationer as Assistant Entomologist [on other duty as Assistant Director (Storage) Government of India, under the Regional Director (Food), Madras.]

(3) S. Sampath, Permanent Cyto-Geneticist, Coimbatore, on foreign service as Cyto-Geneticist at the Central Rice Research Institute, Cuttack.

(4) U. Narasinga Rao, Permanent Horticulturist—Services placed at the disposal of Government of Mysore.

(5) J. P. Walter Devashayam, Assistant Agricultural Engineer (Mechanical) Approved Probationer—On other duty as Assistant Executive Engineer (Electrical and Mechanical) in the Military Engineering Services, Government of India, Ministry of Defence (whereabouts not known).

(6) R. Govinda Menon, approved probationer as Gazetted Assistant to the Assistant Agricultural Engineer (Research), on other duty as Agricultural Engineer, Indian Institute of Sugarcane Research, Rhadrak, Lucknow, under the Government of India, Ministry of Food and Agriculture (Agriculture).

(7) C. S. Balasubramaniam, approved probationer as Assistant Entomologist, on other duty as Assistant Director (Storage) under the Government of India, Ministry of Food and Agriculture (Food).

(8) S. Narayanaswamy, approved probationer as Assistant Agricultural Engineer, on other duty as Assistant Soil Conservation Officer (Engineering), Ootacamund, under the Government of India, Ministry of Food and Agriculture (Agriculture) with effect from 10th March 1955.

(9) L. Krishnan, District Agricultural Officer (Approved Probation) on deputation under the Reserve Bank of India as Lecturer at the Regional Co-operative Training Centre, Madras.

(10) K. Fazlullah Khan, Assistant Horticulturist, on deputation as Cashew and Spices Development Officer under the Government of India, Ernakulam.

(11) K. Kuppumuthu, District Agricultural Officer, on Foreign Service as Secretary, Coimbatore Market Committee, Tiruppur.

(12) Dr. M. Srinivasan, Lecturer in Agricultural Economics, on deputation to the Government of India as Senior Marketing Officer.

(13) R. S. Subramanyan, Assistant Agricultural Engineer, on foreign service as Principal, Nachimuthu Politechnic, Pollachi.

(14) M. Umapathi Mudaliar, Assistant Agricultural Engineer, on other duty as Assistant Engineer, Neiveli Lignite Corporation (Private), Limited, Madras.

(15) A. Venkataraman, District Agricultural Officer, on other duty as Principal, Rural Extension Training Centre, Bhavanisagar.

(16) V. Santhanam, Crop Specialist on deputation to Government of India as Head of the Regional Research Institute, Pircom, Coimbatore.

(17) J. H. S. Ponnayya, District Agricultural Officer, on deputation to Government of India, Training School, Bhavanisagar.

(18) M. Subramanya Chetty, District Agricultural Officer, as as Principal, Rural Extension Training Centre, Krishnagiri.

(19) M. Vaidyanathan, District Agricultural Officer, as Principal, Rural Extension Training Centre, Adhuthurai.

(20) M. Kasiviswanathan, Principal, Rural Extension Training Centre, Pattukottai.

(21) N. Muthuswamy Naidu, Assistant Entomologist, as Assistant Director (Storage) under the Government of India.

(22) V. Srinivasan, Assistant Agricultural Engineer, on deputation as Assistant Soil Conservation Officer (Agronomy) under the Government of India.

(23) M. D. Azariah, Superintendent, Agricultural Research Station, Nanjanad, on deputation as Assistant Botanist, Potato Experimental and Trial Centre, Ootacamund, under the Government of India.

(24) A. R. Bhaskaran, District Agricultural Officer, on deputation as Assistant Soil Conservation Officer (Agronomy) under the Government of India.

(25) V. Mahimaidoss, District Agricultural Officer, as on foreign service as Inspection and Storage Officer, Madras State.

(26) K. Radhakrishna Alwa, Superintendent, Agricultural Research Station, Nanjanad, on deputation to United States of America.

(27) B. Santhanakrishnan, Deputy Director of Agriculture as Director of Agriculture, Pondicherry.

(28) A. R. Seshadri, Lecturer in Entomology, on deputation to United States of America.

(29) C. R. Subramanyam, Assistant Agricultural Engineer, on deputation as Senior Lecturer in Delhi Polytechnic, Ministry of Scientific and Cultural Affairs.

(30) K. M. Sundaram, Seed Development Officer, on other duty as Lecturer in Agriculture, Madras Veterinary College, Madras.

(31) C. R. Shanmugam, Assistant Agricultural Engineer (Soil Conservation), on deputation to Canada.

(32) K. Kannian, Assistant Cotton Specialist, on deputation to Australia.

(33) S. Varisai Mohamed, Assistant Oilseeds Specialist, undergoing Post-Graduate Course.

(34) T. B. Krishnaswamy Rao, undergoing Post-Graduate Course.

(35) A. Subramanyam, Assistant Millet Specialist, undergoing Post-graduate Course.

(36) S. Kamalanathan, Assistant Cotton Extension Officer, undergoing Post-Graduate Course.

(37) C. R. Thiruvengadam, Agronomist, as Cane Development Officer, Madurantakam Co-operative Sugar Mills, Padalam.

(38) V. Sethuram, Assistant Cotton Specialist, as Assistant Cotton Specialist, Khadi Scheme, Tiruppur.

(39) C. R. Venkataraman, Assistant Agricultural Chemist, undergoing Post-graduate Course.

(40) Edwin Amirtharaj, District Agricultural Officer, as Principal, Rural Extension Training Centre, Koilpatti.

(41) K. N. Doraiswamy, District Agricultural Officer, as Principal, Rural Extension Training Centre, T. Kallupatty.

(42) M. Ramachandran, Lecturer in Economics, on deputation to United States of America.

(43) C. Ratnam, Assistant Agricultural Chemist, on deputation to Nagpur for training in Soil Survey.

(44) D. M. Samuel, Assistant Agricultural Chemist, on deputation to Nagpur, for training in Soil Survey.

(45) G. Murugesan, District Agricultural Officer, as Principal, Rural Extension Training Centre, S.V. Nagaram.

(46) K. A. Shoukat Ali, District Agricultural Officer, as Secretary, Tiruchirappalli Market Committee.

(47) S. M. Sulaiman, Joint Director of Agriculture, as Principal, Orientation and Study Centre, Bhavanisagar.

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

(1) Assistant Millet Specialist, Drought Resistance Scheme, Coimbatore.

(2) Assistant Mycologist, Sugarcane Research, Cuddalore.

(3) Assistant Agricultural Engineer (Soil Conservation) Kundah Project, Coonoor.

(4) Assistant Soil Conservation Officer (Agronomy), Coimbatore.

(5) Assistant Agricultural Engineer, Ramanathapuram.

(6) Assistant Agricultural Engineer, Soil Conservation, Cuddalore.

(7) Assistant Agricultural Engineer (River Pumping Scheme), Madras.

(8) Investigation Officer, Coimbatore.

(9) District Investigation Officer, Coimbatore.

(10) Field Manure Officer, Madras.

(11) Assistant Chillies Specialist, Koilpatti.

(12) Assistant Agricultural Engineer, Ramanathapuram at Sattur.

(13) Assistant Horticulturist, Kodaikanal.

(14) Assistant Agricultural Engineer (Package), Thanjavur.

(15) Assistant Botanist, Ooty.

(16) Assistant Agronomist, Sugarcane Research Station, Gudiyatham.

(17) Assistant Horticulturist, Ornamental Plants, Ooty.

(18) Assistant Mycologist (Banana Disease), Coimbatore.

(19) Assistant Oilseeds Specialist, Safflower and Niger, Kovilpatti.

(20) Coconut Development Officer, Ramanathapuram.

(21) Plant Physiologist, Mico-Nutrient Scheme, Agricultural College and Research Institute, Coimbatore.

(22) Assistant Agronomist (Simple Fertiliser Trial), Coimbatore.

(23) Tobacco Development Officer, Coimbatore.

(24) Assistant Horticulturist (Periakulrayan Hills Scheme), Attur, Salem.

(25) Assistant Agricultural Chemist (Phosphate Potential Scheme), Coimbatore.

(26) Plant Protection Officer, Thanjavur.

The following post is abolished during the period under report :—

Assistant Extension Specialist, Coimbatore, with effect from 27th January 1961 afternoon.

The Headquarters of the following posts were shifted :—

Assistant Agricultural Engineer (Soil Conservation Scheme), Manaparai to Tiruchirappalli.

Assistant Entomologist, Sugarcane Insect-Pest Scheme, from Coimbatore to Cuddalore.

II. INSPECTION AND AUDIT.

INSPECTION.

The following officers have been inspected by the officers at Headquarters during the year 1960-1961 :—

I. Offices inspected by the Director of Agriculture :—

- (1) Central Office, Agricultural College and Research Institute, Coimbatore.
- (2) Office of the District Agricultural Officer, Villupuram.
- (3) Office of the Assistant Agricultural Engineer, Inspection, Tiruchirappalli.
- (4) Office of the Assistant Agricultural Engineer, M.B. Shed, Saidapet.

II. Offices inspected by the Joint Director of Agriculture (Planning and Development) :—

- (1) Office of the Assistant Horticulturist, Fruit Development Scheme, Coimbatore.
- (2) Office of the Cane Development Officer, Tiruchirappalli.
- (3) Office of the Cane Development Officer, Madras.
- (4) Office of the Cashew Development Officer, Thanjavur.
- (5) Office of the Oilseeds Development Officer, Coimbatore.

III. Offices inspected by the Joint Director of Agriculture (Inspection and General) :—

- (1) Office of the District Agricultural Officer, Chingleput.
- (2) Office of the Crop and Plant Protection Officer (Entomology), Coimbatore.
- (3) Office of the District Agricultural Officer, Erode.
- (4) Office of the Crop and Plant Protection Officer (Mycology), Madurai.
- (5) Office of the Deputy Director of Agriculture, Madurai.
- (6) Office of the Crop and Plant Protection Officer (Entomology), Thanjavur.
- (7) Office of the State Marketing Officer, Madras.
- (8) Office of the Deputy Director of Agriculture, Coimbatore.
- (9) Office of the Deputy Director of Agriculture, Thanjavur.
- (10) Office of the District Agricultural Officer, Mayuram.
- (11) Office of the Crop and Plant Protection Officer (Mycology), Coimbatore.
- (12) Office of the Deputy Director of Agriculture, Madras.

IV. Offices inspected by the Joint Director of Agriculture (Engineering) :—

- (1) Office of the General Superintendent, Government Industrial Engineering Workshop, Madras-21.
- (2) Office of the Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.

V. Offices inspected by the Additional Director of Agriculture, Madras at Coimbatore :—

- (1) Office of the Sugarcane Specialist, Cuddalore.
- (2) Office of the Banana Research Officer, Aduthurai.
- (3) Office of the Superintendent, Agricultural Research Station, Periakulam.

VI. Offices inspected by the Deputy Director of Agriculture, Madras :—

- (1) Office of the District Agricultural Officer, Chingleput.
- (2) Office of the District Agricultural Officer, Guindy.
- (3) Office of the District Agricultural Officer, Villupuram.
- (4) Office of the District Agricultural Officer, Polur.
- (5) Office of the District Agricultural Officer, Vellore.
- (6) Office of the Assistant Agricultural Engineer (Soil Conservation Scheme), Vellore.
- (7) Office of the Assistant Agricultural Engineer (Soil Conservation Scheme), Panruti.
- (8) Office of the Assistant Agricultural Engineer (Inspection), Vellore.
- (9) Office of the Assistant Agronomist, Sugarcane Research Station, Gudiyatham.
- (10) Office of the Assistant Agricultural Engineer (Inspection), Cuddalore.
- (11) Office of the District Agricultural Officer, Cuddalore.
- (12) Office of the Superintendent, Agricultural Research Station, Palur.
- (13) Office of the Superintendent, Agricultural Research Station, Tindivanam.
- (14) Office of the Assistant Director (Drilling), Chidambaram.
- (15) Office of the Superintendent, Rice Research Station, Tirur.

VII. Offices inspected by the Deputy Director of Agriculture, Madurai :—

- (1) Office of the District Agricultural Officer, Madurai.
- (2) Office of the District Agricultural Officer, Dindigul.

- (3) Office of the District Agricultural Officer, Sivaganga.
- (4) Office of the District Agricultural Officer, Tirunelveli.
- (5) Office of the Superintendent, Agricultural Research Station, Koilpatti.
- (6) Office of the Assistant Agricultural Engineer, Inspection, Madurai.
- (7) Office of the Assistant Agricultural Engineer, Tirunelveli.
- (8) Office of the Assistant-in-charge, Agricultural Research Station, Paramakudi.
- (9) Office of the Fruit Assistant, Model Orchard-cum-Nursery, Periakulam.
- (10) Office of the Assistant Agricultural Engineer, Soil Conservation Scheme, Bathalagundu.
- (11) Office of the Assistant Agricultural Engineer, Soil Conservation Scheme, Dindigul.
- (12) Office of the Coconut Development Officer, Ramanathapuram.
- (13) Assistant Agronomist, Kovilpatti.
- (14) Assistant Oilseeds Specialist, Kovilpatti.
- (15) Office of the Fruit Assistant, Model Orchard-cum-Nursery, Courtallam.
- (16) Office of the Coconut Nursery Assistant, Viswaspuram.
- (17) Office of the Assistant Cotton Specialist, K. 6. and MCU 2. Scheme, Kovilpatti.
- (18) Office of the Assistant Cotton Specialist, Karunganni Scheme, Kovilpatti.
- (19) Office of the District Agricultural Officer, Sattur.

VIII. Offices inspected by the Deputy Director of Agriculture, Coimbatore :—

- (1) Assistant Agricultural Engineer, Soil Conservation, Coimbatore.
- (2) Office of the Assistant Agricultural Engineer (Sub-Assistant Training Centre), Coimbatore.
- (3) Office of the Assistant Oilseeds Specialist, Pollachi.
- (4) Office of the Assistant Cotton Specialist, Tirupur.
- (5) Office of the Assistant Agricultural Engineer, Inspection, Coimbatore.
- (6) Office of the District Agricultural Officer, Salem.
- (7) Office of the Assistant Agricultural Engineer, Soil Conservation, Salem.
- (8) Office of the District Agricultural Officer, Erode.
- (9) Office of the District Agricultural Officer, Coimbatore.

- (10) Office of the Assistant Director (Drilling), Salem.
- (11) Office of the Assistant Agricultural Engineer, Soil Conservation and Dry Farming Scheme, Palladam.
- (12) Office of the Assistant Millet Specialist, Sathyamangalam.
- (13) Office of the Superintendent, Agricultural Research Station, Bhavanisagar.
- (14) Office of the District Agricultural Officer, Krishnagiri.
- (15) Office of the District Agricultural Officer, Ooty.
- (16) Office of the Curator, Government Botanic Gardens, Ooty.
- (17) Office of the Assistant Agricultural Engineer, Soil Conservation Scheme, Ooty.
- (18) Office of the Assistant Horticulturist, Coonoor.
- (19) Office of the Assistant Agricultural Engineer, Soil Conservation Scheme, Coonoor.
- (20) Office of the Superintendent, Agricultural Research Station, Nanjanad.

IX. Offices inspected by the Deputy Director of Agriculture, Thanjavur :—

- (1) Office of the Assistant Oilseeds Specialist, Pattukottai.
- (2) Office of the Superintendent, Agricultural Research Station, Pattukottai.
- (3) Office of the District Agricultural Officer, Pattukottai.
- (4) Office of the Assistant Entomologist, Paddy Stem Borer Scheme, Aduthurai.
- (5) Office of the Assistant Mycologist, Stem Rot of Rice, Aduthurai.
- (6) Office of the Superintendent, Agricultural Research Station, Aduthurai.
- (7) Office of the Assistant Paddy Specialist, Thalainayar.
- (8) Office of the Assistant Agronomist, Lakshmgudy.
- (9) Office of the Assistant Oilseeds Specialist, Karur.
- (10) Office of the Assistant Agronomist, Sugarcane sub-station, Sirugamani, Tiruchirappalli District.
- (11) Office of the District Agricultural Officer, Thanjavur.
- (12) Office of the District Agricultural Officer, Tiruchirappalli (North).
- (13) Office of the Assistant Agricultural Engineer, Inspection, Tiruchirappalli.
- (14) Office of the Assistant Soil Chemist, Aduthurai.

(15) Office of the Assistant Agricultural Engineer, Soil Conservation Scheme, Manaparai.

(16) Office of the District Agricultural Officer, Mayuram.

(17) Office of the Assistant Paddy Specialist, Peravurani.

(18) Office of the District Agricultural Officer, Kumbakonam.

SURPRISE INSPECTION.

During the year 1960-61, surprise inspection of stores was conducted by the Superior Officers of the department. The number of offices and depots inspected by them are furnished below :—

Officer.	Depots and offices.
1. Director of Agriculture, Madras	17
2. Dean and Additional Director of Agriculture ...	30
3. Joint Director of Agriculture (Inspection and General)	4
4. Joint Director of Agriculture (Planning and Development)	2
5. Joint Director of Agriculture (State Seed Farm)	5
6. Joint Director of Agriculture (Extension) ...	11
7. Joint Director of Agriculture (Engineering) ...	12
8. Joint Director of Agriculture (Package programme), Thanjavur	2
9. Deputy Director (Drilling)	6
10. Deputy Director of Agriculture, Madras ...	32
11. Deputy Director of Agriculture, Coimbatore ...	20
12. Deputy Director of Agriculture, Thanjavur ...	45
13. Deputy Director of Agriculture, Madurai ...	18
14. Associate Dean	28
15. Agricultural Engineer (Headquarters)	7

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

AUDIT BY INTERNAL AUDIT PARTIES.

Consequent on the decentralisation of audit, four audit parties which were functioning at headquarters were attached to each of the regional Deputy Directors of Agriculture and three audit parties, each consisting of one Superintendent, and two Upper Division Clerks were functioning at headquarters. Out of the three, one audit party was exclusively attending to the audit of the accounts relating to Soil Conservation Schemes. The other two audit parties were engaged in the audit of accounts of the officers and institutions under the direct control of the Director of Agriculture, viz., Agricultural College and Research Institute, Coimbatore, Assistant Agricultural Engineer (M.B. Shed),

Saidapet; Assistant Agricultural Engineer, Tractor Workshop, Coimbatore; Regional Deputy Directors of Agriculture, State Marketing Officer, Madras; State Compost Development Officer, Madras; Cane Development Officer, Madras; Farms for which Regional Deputy Directors are the drawing officers, etc. The services of these parties were also utilised for taking up special audit in connection with the investigation of irregularities in accounts in any of the offices or institutions, the general audit of which is under the control of Deputy Directors of Agriculture. A few cases of special audit undertaken by the audit parties in the Districts are given below :—

- (1) Agricultural Demonstrator, Tirumarugal.
- (2) Extension Officer (Agriculture), Budalur.
- (3) Extension Officer (Agriculture), Perambalur.
- (4) Extension Officer (Agriculture), Tirukattupalli.
- (5) Extension Officer (Agriculture), Saidapet.
- (6) Agricultural Demonstrator, Nagercoil.
- (7) Special Agricultural Demonstrator, Madurai.
- (8) Special Audit of Block Development Officer, Sattur.
- (9) State Seed Farm, Devakottai.
- (10) Government Botanic Gardens, Ootacamund.
- (11) Agricultural Research Station, Bhavanisagar.
- (12) Assistant Agricultural Engineer (Inspection), Coimbatore.
- (13) Assistant Director (Drilling), Coimbatore.

2. *Progress of Audit.*—A statement showing the number of offices and institutions to be audited under the control of the Director of Agriculture as well as under the control of the Deputy Directors 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.		Total.	Number of institutions audited.	Balance.
	Number to be audited by end of 1958-59.	Number which became available for audit during 1959-1960.			
(1)	(2)	(3)	(4)	(5)	(6)
I. Office of the Director of Agriculture, Madras.	120	36	156	94	62
II. Office of the Deputy Director of Agriculture, Madras.	100	144	244	22	222
Thanjavur	133	146	279	66	213
Coimbatore	50	105	155	28	127
Madurai	85	102	187	22	165

The delay in completing the audit of all the institutions within the prescribed time limit of one year after the close of the year of the accounts is due to the opening of new blocks under National Extension Service Scheme, opening of State Seed Farms, bifurcation of the offices of the District Agricultural Officers, the audit of accounts of Drilling Department being taken over from the Industries Department from 1st April 1958 onwards as well as other miscellaneous items of work like checking of *pro forma* accounts of the various Agricultural Engineering Scheme for incorporation in the Appropriation Accounts as required by the Accountant-General and the diversion of Audit parties to special audit work when serious irregularities such as misappropriation of money and stores resulting in loss to Government are reported by the subordinate officers. The audit is already in arrears for more than two years and to cope with the increased work in audit and to bring the audit work up-to-date, proposals have been sent to Government for additional staff of one Accounts Officer and six Audit Parties each consisting of one Superintendent and two Upper Division Clerks. Of these, two parties will be at headquarters and the remaining four will be attached to the Deputy Directors.

3. *Progress of clearance of audit objections.*—A statement showing the number of audit objections (inclusive of those raised in internal audit by the Chief Auditor, State Trading Scheme, Madras, 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 pendency at the end of the year are given below :—

Name of office.	Number pending at the beginning of the month.		Number added during the year.	
	of Number reports.	of Number Objections.	of Number reports.	of Number Objections.
(1)	(2)	(3)	(4)	(5)
I. Office of the Director of Agriculture, Madras.	427	6,869	102	2,760
II. Office of the Deputy Directors of Agriculture—				
Thanjavur	285	6,407	81	2,585
Coimbatore	258	6,326	21	10,302
Madurai	380	10,280	22	1,015
Madras	433	13,641	12	1,265

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.	
			Number of reports.	Number of Objections.
(6)	(7)	(8)	(9)	
I. Office of the Director of Agriculture, Madras.	1,801	318	471	9,034
II. Office of the Deputy Directors of Agriculture—				
Thanjavur	1,254	737	253	5,831
Coimbatore	..	174	245	14,150
Madurai	4,369	75	251	6,851
Madras	262	..	348	14,644

4. For early clearance of audit objections, the Accounts Officer and Junior Accounts Officer of this Office carried the long-pending audit files to their camps, discussed the matter with the concerned officers and settled the objections on the spot wherever possible after perusing the relevant records. Besides the above, a list of audit files pending for more than a year were taken by the Director of Agriculture also during his camp for discussion with the Officers concerned and suggesting the lines on which replies could be sent for the final settlement of the objections. The progress of clearance of audit objections was also critically reviewed on the basis of the half-yearly statements of pendency of audit objections in the Accountant-General's audit reports received from Government. Thus all possible steps were taken to clear the long pending audit objections as quickly as possible.

III. AGRICULTURAL EDUCATION.

(i) *B.Sc. (Ag.), Degree Course.*—The second and final year B.Sc. (Ag.), classes of 1960-61 batch as well as the I year B.Sc. (Ag.), classes for 1960-61 were in session from 15th June 1960 after admitting the successful candidates in the Pre-Professional Examination in Agriculture held in April, 1960. Besides the admission of successful candidates from the Pre-Professional Examination in Agriculture into the first year B.Sc. (Ag.), there were certain casual vacancies. These vacancies were filled by candidates selected by a Committee constituted by Government of Madras for the selection and admission of candidates for Pre-Professional Course in Agriculture and I year B.Sc. (Ag.) Course comprising of (1) Sri V. T. Subbiah Mudaliar, Chairman (2) Sri V. K. Subramania Mudaliar, (3) Principal, Madras Veterinary College, (4) Dean, Agricultural College, Coimbatore, Convenor.

The number of admissions to the B.Sc. (Ag.) degree course at the Agricultural College and Research Institute was 162. This number was fixed during the year 1956-57. The seats filled up were as follows :—

1. Intermediate candidates belonging to Madras who were interviewed and selected	...	...	29
3. Detained students admitted	...	...	4
Agriculture	...	...	129
3. Detained students admitted	...	...	4
Total	...	...	162

The number of students on roll in each of the three classes of B.Sc. (Ag.) at the end of the academic year 1960-61 was as under :—

	Men.	Women.	Total.
First year B.Sc. (Ag.)	150	8	158
Second year B.Sc. (Ag.)	185	3	188
Third year B.Sc. (Ag.)	150	4	154

(ii) *Pre-Professional Course in Agriculture.*—Consequent on the re-organisation of the University Courses, the running of Pre-Professional Course in Agriculture was introduced from the academic year 1957-58. For want of adequate accommodation facilities viz., laboratories and class rooms, it was found necessary to conduct the course at the following two colleges for the past four years :—

(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 the Pre-Professional Course in Agriculture was 162, and as per Government Orders, 137 seats were filled by State candidates and three from Pondicherry. The balance of 22 seats were kept unfilled so as to be filled up in the I year B.Sc. (Ag.) degree course by students nominated by Government of India, for sons of Central Government employees and for failed and detained students who may seek re-admission.

The above 137 candidates of Madras State were admitted from the approved selection and waiting list prepared by the Selection Committee. The number of applications received for admission to the Pre-Professional Course in Agriculture was 810 and of these only 575 turned up for the interview. The selected list of candidates was received from the Government after approval on 24th July 1960 and the candidates were instructed to join the respective Arts Colleges on 28th July 1960. The vacancies caused by candidates who failed to join the course and by candidates

leaving the College by getting themselves admitted elsewhere were filled up by the candidates in the waiting list, as per the directions issued by Government.

The details of students admitted to Pre-Professional Course in Agriculture during 1960-61 in two Colleges are as shown below :—

1. Government Arts College, Coimbatore	...	...	88	(85 plus 3 (Pondicherry students).
2. St. Xavier's College, Palayamkottai	...	...	52	
Total	...	...	140	

(iii) *Post-Graduate Courses.*—The number of seats fixed for admission to Post-Graduate Course leading to M.Sc. (Ag.), and Ph.D., at the Post-Graduate Research Institute, Coimbatore, continued to be 40.

A total of 117 applications for M.Sc. (Ag.) and seven for Ph.D. Courses were received. Out of these, 35 were selected and admitted for M.Sc. (Ag.) and five for Ph.D. Course. The College re-opened for Ph.D. Course on 1st September 1960. The College for the senior trainees of M.Sc. (Ag.) second year was in session from 1st September, 1960. The six faculties viz., Horticulture, Plant Breeding and Genetics, Plant Pathology, Entomology, Agronomy and Soil Science, continued to function during the year, under report.

(iv) *Intensive Practical Farm Training in Agriculture.*—As per the regulations of the Madras University Governing B.Sc., (Ag.), degree course students of the Final B.Sc. (Ag.) class were given farm and extension training for a period of two months subsequent to their completing the final examination. The training for the 1960-61 batch commenced on 5th May 1961.

(v) *Students Tour.*—The students of B.Sc. (Ag.) classes were taken on educational tour to study the local Agricultural practices in vogue at different localities within the State as well as outside the State. The details are furnished below :—

(a) *Second Year B.Sc. (Ag.) Students :—*

(1) Rural Extension Training Centre and Agricultural Research Station, Kovilpatti.

(2) Agricultural Research Station, Ambasamudram.

(3) Fruit Farm and Private Farms, Kanyakumari district.

(4) Municipal Compost Yard, Madurai.

(5) Agricultural Research Station and Banana Research Station, Aduthurai.

(6) Sugarcane Research Station, Cuddalore.

(7) Agricultural Research Station, Tindivanam.

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

(b) *Final Year B.Sc. (Ag.) students :—*

(1) *Mysore.*—Central Food Technological Research Institute, Chemicals and Fertilisers Limited, Paddy Research Station (Nanganahalli), Krishnarajasagar, Garden and Government Orchard.

(2) *Bangalore.*—Lal-Bagh Gardens, Dairy Farm, Poultry Dairy Research Institute (Adagodi), Cubban Park.

(3) *Hosur.*—Dairy Farm and Sheep Farm, Poultry Farming and Piggery and Hay-making Yard.

(4) *Madras.*—(i) Poultry Farm and Milk Supply Union, Teynampet.

(ii) Milk Supply Union (Ayyanavaram).

(iii) Milk Colony (Madhavaram).

(vi) *Miscellaneous Courses*—(a) *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 sanctioned the scheme for running the refresher course in Agriculture for young farmers in the age group of 16 to 26 years for a period of six months in order to give them an all-round practical training in Agriculture and allied subjects.

The eighth course of training for Young Farmers was conducted from 15th October 1960 to 14th April 1961 with 24 Young Farmers, eighteen of them completed the course. The trainees were given intensive practical training in all aspects of improved agriculture for a duration of 348 hours supplemented by regular lectures in Tamil. In addition special lectures were delivered by the following Officers :—

(1) District Veterinary Officer, Coimbatore—4 hours.

(2) Poultry Development Officer, Madras—2 hours.

(3) Artificial Insemination Assistant, Coimbatore—2 hours.

The trainees were also taken on special study tour for 18 days from 6th to 23rd March 1961 to important places of agricultural interest namely, Sugarcane Research Station, Gudiyatham, Poultry Farm, Katpadi and Teynampet, Co-operative Milk Supply Union, Ayyanavaram, Central Sugarcane Research Station, Cuddalore, Nellikuppam Sugar Factory, Agricultural Research Station, Aduthurai Fruit Research Station, Periakulam Sewage Farm,

Madurai, Agricultural Research Station, Kovilpatti and Rice Research Station, Ambasamudram. The training proved useful for these young farmers.

(b) *In-Service Training for Agricultural Extension Officers.*—Three batches of trainees consisting of 85 Extension Officers were given in-service training for the duration of four weeks for each batch. This proved useful to the officers in acquainting themselves with the latest achievements, developments and trend of research in the department.

(vii) *University Examination.*—During the year under report, the College Terminal Examinations were conducted for the First, Second and Final Year B.Sc. (Ag.) in September and December 1960. Besides the supplementary examination in October 1960, the annual Examination in April 1961 were conducted by the University of Madras. The University Examination for M.Sc. (Ag.) was conducted in June 1961. The details of the results are furnished below :—

Class.	Number of candidates appeared for examination.	Number of successful candidates.	Percentage.
(1)	(2)	(3)	(5)
First B.Sc. (Ag.) ..	166	96	58
Second B.Sc. (Ag.) ..	205	177	86
Final year B.Sc. (Ag.) ..	146	115	79
M.Sc. (Ag.)	38	37	97

The results of the supplementary examination held in October 1960, are as below :—

Class.	Number of candidates appeared for examination.	Number of successful candidates.	Percentage.
(1)	(2)	(3)	(4)
First year B.Sc. (Ag.) ..	95	80	84
Second year B.Sc. (Ag.) ..	79	49	62
Final year B.Sc. (Ag.) ..	34	34	100

(viii) *College Hostel—Staff.*—The hostel attached to the Agricultural College and Research Institute, Coimbatore, was managed by the Associate Dean as Ex-officio Warden assisted by two Gazetted Officers designated as Senior Deputy Wardens. One of them was in-charge of the Old Hostel and the other in-charge of the New Hostel.

Sri S. Mutraswamy, Lecturer in Horticulture as Senior Deputy Warden (Old Hostel) and Dr. S. Krishnaswamy, Associate Professor of Animal Husbandry as Senior Deputy Warden (New Hostel) continued throughout the year.

Accommodation and strength.—The strength of the hostel at the beginning of the year was 584 in both the hostels while at the end of the year, it was 618. The details are as follows :—

	Hostellers.	Day scholars.	Total.
(1)	(2)	(3)	(4)
(a) First year B.Sc. (Ag.) ..	136	4	140
(b) Second year B.Sc. (Ag.) ..	136	28	164
(c) Third year B.Sc. (Ag.) ..	155	37	192
(d) Final year (Farm trainees).	133	20	153
(e) Ph.D. Students	3	3	6
(f) M.Sc. (Ag.), Juniors ..	26	8	34
(g) M.Sc. (Ag.), Seniors ..	29	9	38
Total ..	618	109	727

Ladies Hostel.—The strength of the lady students' hostel during the year was 10. As one 'C' type quarters C-10 was found insufficient, the adjacent 'C' type quarters, viz., C-1, was also converted into Ladies Hostel with effect from 5th August 1960.

Foreign students.—There were two students from Thailand and one from Ceylon pursuing Post-Graduate and under-Graduate courses respectively.

Health.—The general health of the inmates of the hostel remained satisfactory, except for sporadic cases of Chicken-pox. Prophylactic measures were immediately taken to prevent the infection by vaccinating all the students. Dr. T. S. Veera Raghavan of the Lawley Road Dispensary, Coimbatore, continued to be the Medical Officer for the Hostel. The Medical Room attached to the Hostel was strengthened by the purchase of urgently needed costly drugs and equipment. The Nursing Orderly continued to work helping all the sick patients during the period under report.

Messes.—In the old hostel, two non-vegetarian and two vegetarian messes functioned. Of these one vegetarian mess was working on a fixed-rate basis run by a contractor while the remaining three were managed by the students. In the new hostel, one vegetarian and one non-vegetarian mess functioned and both were managed by the students. The student representatives were associated in all matters relating to the running of the messes. The average strength of the messes and average daily rate of mess charges for the year were as follows :—

Name of the messes.	Average strength.	Average			
		Daily rate.		Minimum daily rate.	
		(3)	(4)	(5)	(6)
(1)	(2)	RS. NP.	RS. NP.	RS. NP.	RS. NP.
(a) Vegetarian mess (old hostel) ..	63	1 47	1 68	1 34	1 34
(b) Vegetarian mess (new hostel) ..	80	1 34	1 51	1 16	1 16
(c) Non-vegetarian mess A (old hostel) ..	76	1 62	1 78	1 41	1 41
(d) Non-vegetarian mess B (old hostel) ..	108	1 60	1 76	1 46	1 46
(e) Non-vegetarian mess (new hostel) ..	113	1 59	1 81	1 40	1 40
(f) Contract mess	56	1 30	1 30	1 30	1 30
			(Fixed rate)		

Stores provisions and Vegetables.—The purchases of market articles like meat, eggs, fowl, plantain leaves and bakery products were continued to be effected through tender system.

The groceries and provisions needed for the hostel were purchased after scrutiny of the quotations from local whole sale dealers every month. Vegetables were generally purchased in the market by the student representatives. The total cost of provisions and vegetables purchased and consumed in the Students Messes during the year were as follows :

	RS.	NP.
1 Provisions	1,14,618	75
2 Vegetables	28,407	92
3 Milk	38,072	73
4 Fuel	10,714	72
Total ..	1,91,814	12

Vessels and furniture.—Vessels and furniture were also purchased during the year for a total value of Rs. 11,355 from both Government and Hostel funds.

Purchase and Amenities Committee.—The Purchase and Amenities Committee constituted in the year 1955 continued to function efficiently. The Associate Dean and Ex-Officio Warden was the Chairman of the Committee and three other members were from the Senior Non-teaching Gazetted Officers. Meetings were held every month to consider all questions pertaining to the working of the Hostel and the Messes and also for considering the amenities to the students.

Students' canteen.—The Students' Canteen continued to cater the needs of the students in respect of stationery articles as well as serving coffee and snacks. The Canteen continued to work on a "NO PROFIT—NO LOSS" basis. The total out-turn in the Canteen during the period was as follows :—

	RS.	NP.
1 Stationery section	24,802	69
2 Coffee and snack section	20,095	82

Integration of Pre-Professional Course.—Consequent on the introduction of Four-Year integrated B.sc. (Ag.) course and institution of First-Year B.sc. (Ag.) course from the commencement of the academic year (1961-62), arrangements were made for purchases of furniture required for 162 additional students. Additional vessels required for running the existing messes were also provided.

Water supply and sanitation.—The scavenging staff of sanitary section were regularly attending to their duties. The sanitary staff for the new hostel was strengthened. Drinking water for the hostel was obtained every day from the Municipality.

Other amenities to the Students.—The following were some of the important amenities provided during the year :—

(a) Tube lights were removed in the Hostel corridors and in dining rooms enhancing the lighting efficiency.

(b) Special repairs to the pipe lines leading to closets in the Old Hostel were carried out.

(c) Electrical rewiring was done and new electric connections were provided for bath-rooms and closets of the Old Hostel.

(d) Special repairs to Hostel buildings were also carried out.

(e) Special drugs and medicines were purchased and stocked in the Medical Room of the Hostel.

(f) Special stands for holding drinking water jugs were also purchased.

(g) Teakwood cots were provided for Post-Graduate rooms and for the Ladies Hostel. A total of 100 cots was also purchased for the students of the Old Hostel.

(h) A Store-room for vegetables and a fuel-shed were constructed.

Film Show.—The fortnightly film shows were continued. A total of 15 feature films and 21 films of agricultural and educational interest were screened during the year under report.

(ix) *Students' Club.*—All students were members of the club. The year under review was a good one as far as games and sports were concerned. Sri Sethumadavan continued to be Physical Director.

Facilities available for the following games were fully utilised : (1) Foot-ball (2) Hockey (3) Cricket (4) Tennis (5) Volley-ball (6) Basket ball (7) Badminton (8) Ring Tennis. The students evinced an active interest in in-door games also. The college as usual took part in the University Tournamnets, Inter-collegiate Athletic Association League Tournaments, District Basket-Ball and Cricket Association Tournaments and other local tournaments. One of the students was selected to represent the Madras University in Foot-ball team.

In the University Tournaments, the College team won the Divisional Championship in Badminton for the third year in succession. One student Sri Noel Irudayaraj was selected to represent Madras in Foot-Ball Tournament. In the Athletic Meet, two students of this College represented this division in the Inter-Divisional Athletics meet. In the League tournament, the College won the Volley-ball shield. The College Hockey and Cricket teams went on a tour to Madurai and played with other Colleges.

(x) *Civil Engineering Section.*—This section is mainly inter-led for teaching. However, the work relating to the petty constructions and repairs to all the buildings in the estate was also attended to. The 400 residential and non-residential buildings and also the roads of eight miles length in the College Estate were properly maintained by this Section. During the period under report, 140 estimates for annual repairs and special repairs to residential and non-residential buildings and also for repairs to roads and for a few original works were prepared and carried out. Besides, 50 estimates which were received from outside stations were scrutinised and sent back for sanction by the Director of Agriculture.

(xi) *Mechanical Engineering Section.*—The Section continued to be in-charge of teaching and also maintenance of electric and water-supply installation in the estate, gas supply to the Laboratories and maintenance of College buses.

Buildings.—The construction of a second Gas House at a cost of Rs. 9,500 was completed. This would house three gas producing units which have already been purchased. The Government have sanctioned the construction of a 20,000 gallons capacity water reservoir at an estimated cost of Rs. 63,000 during the year 1961-62.

Works—Water-supply.—A new 2 by 2½ Kirlosker pump capable of discharging 7,000 gallons per hour of water was erected in the yard well. In the Old Hostel bath room water lines were renewed and inter-connected with the estate main water supply to avoid breakdowns.

Electricity.—The staff in-charge maintained an uninterrupted supply of electricity for 10 miles of roads inside the campus. Besides, 3200 light points and 120 domestic services excluding small power loads in various sections of the Research Institute and Post-Graduate Blocks were also maintained by them satisfactorily. The irrigation needs to crops catered to by twenty-nine (29) pump sets including two higher horse power motors were also maintained efficiently. Apart from the above, 15 industrial loads and two D.C. Generators were maintained satisfactorily.

Current consumption and charges.—The off-take of power consumption reached a total of 3,83,625 units as against 3,39,454 units of the previous year. Consequently the current consumption charges for the year rose to Rs. 37,919-72 as against Rs. 28,474 of the previous year. The increase was mainly due to the installation of four high power irrigation pumpsets.

Gas supply.—During the period, there were 52 Gas Productions and a total of 7,07,900 cubic feet of Kerosine gas was produced and supplied to laboratories. The gas mains from the gas house to the Chemistry Laboratory and Research Institute

Laboratories were renewed at a cost of Rs. 6,000. The proposal for the purchases of Petrol Gas plant to meet the additional demand for Post-graduate buildings were finalised.

Vehicles.—One bus, MDS. 9718, used as an amenity for the estate student residents was maintained satisfactorily. The van MSY 3808 used by the Dean and Additional Director of Agriculture was also maintained satisfactorily.

(xii) *Animal Husbandry Section.*—A total of 664 in-patients and 3,906 out-patients were treated during the period under report. The average annual attendance for the hospital was 78.31 per day.

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

Preventive inoculation.—A total of 271 birds were protected against Ranikhet disease by the freeze-dried Ranikhet vaccine. Besides, 78 birds were protected against fowl pox by pigeon vaccine and 267 birds were protected against fowl pox by fowl pox vaccine. A total of 178 bullocks of the various breeding stations of the campus were also protected.

Laboratory works.—In the Animal Husbandry Laboratory 528 specimens were examined during the period.

Bull service.—Gir Bull No. 13 stationed in the Veterinary Hospital served 55 cows during the year. Artificial insemination Sub-Centre of the Animal Husbandry Department continued to function and an average of 300 animals per month were inseminated at this sub-centre.

(xiii) *Central Exhibition.*—The Central Exhibition continued to attract increasing numbers of visitors. The Exhibition continued to be in-charge of the Exhibition Assistant helped by one attender. A total of 26,551 visitors visited the exhibition during the period under report. Out of them, 48 were foreign scientists, 69 very important personages and 3,621 interested farmers. The remaining 22,813, were students and teachers largely drawn from the Colleges and other educational institutions.

(xiv) *College Museum.*—As usual, the College Museum continued to attract a large number of visitors. Most of them were students from High and Elementary Schools. A total of 34,538 persons visited the Museum during the year.

Eleven stuffed and thirteen preserved Zoological Specimens and two skeleton structures were added to the Museum.

(xv) *Artist section.*—Seven Artists were on work at Agricultural College and Research Institute, Coimbatore, during the period under report. One of them was an artist photographer

who attended to photographic work of all the Research Sections and the other six helped the specialists in preparing sketches and posters for exhibition purposes. The Section was under the control of Extension Specialist and the following items of work executed during the period :—

1. Photographs taken	...	...	...	507
2. Printing and enlarging	...	...	...	1,092
3. Glazing, retouching and spotting	...	...	...	1,196
4. Posters	...	...	...	108
5. Paintings	...	...	...	50
6. Pens and ink drawings	...	...	...	168
7. Pencil sketches	...	...	...	169
8. Show cards and labels	...	...	...	3,055
9. Miscellaneous	...	...	...	289
Total				6,634

(xvi) *Library—New additions to the Library.*—A total number of 1,868 books and 600 current issues of periodicals were added to the library during the year.

Loan service.—To the Departmental Officers, a loan of 8,350 books were issued. A total of 46,753 books and publications were also consulted by them. The library was also used by the officers of the Regional Botanical Survey of India, Coimbatore, and the Central Sugarcane Breeding Institute, Coimbatore.

Shelf register cards.—The Shelf Register Cards were prepared for all the volumes in the library.

Abstract service.—The Service of Abstracting and Classification of important articles in current literature for the benefit of officers of the department continued during the year.

(xvii) *College Estate Committee.*—The Committee met almost every month to consider the measures for improving sanitation and amenities. Sri S. Kulathu Iyer and Sri L. Vadivelu Librarian continued to be the representatives of the Estate residents. During the year under report, the Committee met seven times.

(xviii) *Sanitation.*—The estate sanitary branch was attached to the Civil Engineering Section. The maintenance of the sanitation of the estate as well as hostels and rest house was very satisfactory.

Mosquito control.—There were one Field Assistant and one spray man and three mazdoors engaged in this work. They were attending constantly to the spraying of insecticides all over the campus including houses as a mosquito control measure.

Prevalence of infectious diseases.—There were nine cases of chicken pox reported during the year in the campus and necessary preventive measures were taken in time including preventive vaccination.

Vital statistic.—There were 19 births and ten deaths in the campus during the period under report.

(xix) *Rest-House.*—The rest house was maintained satisfactorily during the year.

(xx) *Miscellaneous*—(a) *Board of Honorary Visitors.*—The Board met on 18th October 1960 and the members considered the action taken on their remarks during their previous visit. They also had further remarks to offer and necessary action was taken on their recommendation.

(b) *College Day and Conference.*—The Forty-third College Day and Conference was celebrated from 19th August 1960 to 22nd August 1960. Sri S. K. Patil, Union Minister for Food and Agriculture, inaugurated the Conference.

(c) *Departmental Officers' Conference.*—The Departmental Officers' Conference was held on 20th August 1960 under the presidentship of Sri M. Bhaktavatsalam, Minister for Home and Agriculture, when matters of departmental interest were discussed in detail.

(d) *Academy of Agricultural Science.*—The Academy Agricultural Sciences was inaugurated by Hon'ble Sri M. Bhaktavatsalam on the afternoon of 20th August 1961 and monthly meetings of the Academy was also conduct regularly.

(e) *Farmers' Day Celebration.*—The Farmers' Day Celebration at the Central Farm was conducted on 20th August 1960 under the presidentship of Sri V. S. Thiagaraja Mudaliar and was largely attended.

(f) *College Day Sports.*—The Annual College Day Sports were conducted on 21st August 1960 when G. Ramachandran, the Collector of Coimbatore, presided and Srimathi Ramachandran distributed the prizes.

(g) *Symposium.*—On 21st August 1960, the Symposium 'Agricultural Development in the Package Plan' was discussed under the Presidentship of Sri J. V. A. Nehemiah, Extension Commissioner, Government of India.

(h) *The Second State Extension Council.*—The Second State Extension Council meeting was held on 22nd August 1960 under the Chairmanship of Sri A. Venkatesan, Director of Agriculture, Madras. The Council dwelt on the various aspects of extension and the problems affecting farmers in the State and also on the manner in which Research Achievements could be quickly disseminated to the farmers.

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

(xxi) *Extension Section—Agricultural College, Coimbatore—General.*—The Agricultural Extension Section at the Agricultural College and Research Institute, Coimbatore, was constituted as per G.O. Ms. No. 2136, Food and Agriculture, dated 28th May 1959, with the following objectives :—

(i) To give training on extension principles and practices to the under-graduates of the College.

(ii) To act as a liason between the Extension Officer working in the Districts and Research Personnel in the Research Institute and to disseminate to the farmers, the Research Achievements through the Extension Officers and carry Farmers' problems to the Research Workers for solution or to undertake new research.

(iii) To evaluate the Agricultural Extension Programme through surveys.

This section plays the major role of (pooling out exhibits from the various sections) helping in organizing and running of important exhibitions. This section is also entrusted with the maintenance and running of the Central Exhibition and the College Museum.

Education.—The classes for the teaching of extension methods were conducted during the entire academic year in two batches for the final year B.Sc. (Ag.) students. There was a theory class of one hour duration for each batch and three practical classes of two hours duration each week which were conducted by the Extension Specialist. The Assistant Extension Specialist in-charge of teaching assisted by the Extension Demonstrators conducted the practical classes. During the year, there were 36 hours of theory and 216 hours of practical classes.

Intensive Farm Training.—According to the regulations of the Madras University students of the B.Sc. (Ag.) class have to put in two months of farm and extension training subsequent to their sitting for the final examinations. The responsibility for conducting this intensive farm and extension training was with the Extension Section.

There were in all 145 B.Sc. (Ag.) for the two months training and they assembled on 5th May 1961. Classes were conducted on Farm Management and Agricultural Extension. The students acquainted themselves with the various strains produced and their suitability to various tracts. They were given practical training in the conduct of method and result.

demonstrations running of village seed farms, and many other extension development activities. Opportunity was given to them to learn the art of addressing gatherings, writing articles, preparation of posters, charts, etc. Maintenance of registers and other records at the Agricultural Depot was also shown to them. The trainees were also given training in the Bhavanisagar Block and in Thondamuthur Block in batches on all aspects of Block Administration and Extension. In short, they were given a thorough practical training in Extension Work to enable them to start functioning as successful Extension Officers. The syllabus prescribed by the University of Madras for the two months programme was covered.

Inservice Training to Agricultural Extension Officers.—The Inservice Training for the Agricultural Extension Officers and Instructors from the Rural Extension Centres was continued during the year. Three batches of trainees consisting of 85 Extension Officers were given inservice training for the duration of four weeks for each batch during the period under report. The course included a study of the principles and methods of extension, latest extension techniques, programme planning, etc., and also included talks and discussions by different specialists in their respective fields of specialization and subject-matter. Visits to Research Stations, the Laboratories and also field trips to places of agricultural interest were arranged. One batch of trainees witnessed the aerial spraying at Pollachi to control the red hairy caterpillar pest on groundnut crops.

Training to Extension Officers on the preparation of Farm Production Plans.—The Extension Specialist was associated in the conduct of two training classes of three days duration each at Pattukottai and Aduthurai for the Extension Officers in the Thanjavur district, on Farm Production Plans for the regions included in the Package Programme. The difficulties in the preparation of farm productions plans during the previous year were reviewed and improvements necessary during the current year were discussed thoroughly, besides giving guidance in the preparation of model farm production plans. The extension Specialist also associated in the conduct of two classes at Thanjavur along with Dr. Malone of Ford Foundation for the Extension Officers, on the preparation of detailed Farm Production Plan in the Thanjavur district.

Post-Graduate Training.—Eight hours of classes were held for the M.Sc. (Agronomy) students on agricultural extension principles by the Extension Specialist.

Dissemination of Research.—A hand book which incorporates the improved agricultural practices and other useful information was prepared by the section and the mimeographed copies were released to the outgoing B.Sc., (Ag.) students, for their guidance,

The section prepared a manual on improved agricultural practices in Tamil for use by the Panchayats in their agricultural improvement work.

Agrisearch News.—The Agrisearch News is intended to keep the extension workers in the districts informed of the findings of research and also of progress of research. As at present situated, the extension officers have no facility to keep in touch with these developments being located in interior areas. The quarterly circular letter designed "Agrisearch News" embody useful findings of research and of the nature of research programme on hand, their specific objectives, progress and trends, etc., for use by the Extension Officer. Two issues of the "Agrisearch News" were published and copies supplied to those Extension Officers who wanted them.

Agricultural Jottings.—The publication of the Agricultural jottings is intended to convey to farmers and extension workers information of improved agricultural practices that could be adopted in each month. This new service, in which notes are published every month high-lights the improved agricultural practices that could be adopted in the particular month and is expected to remind the farmers on the details of these practices in time. This service covers a few of the English and vernacular journals and dailies published in the State. The publication commenced from March 1961. An advance copy of the jottings is also sent to the Editor, and Chief Production Specialist, Publications Division, Indian Council of Agricultural Research, New Delhi, for giving publicity through his agency.

Running of a Pilot Farm Development Project in two villages.—Two villages, Thennamanallore and Kalikannichenpalayam have been selected in the adjacent Thondamuthur Block for the extension of a comprehensive agricultural extension programme. These villages will serve as a testing ground for new research achievements as well as to test new extension programmes. For this purpose, the potentialities of individual holdings for increasing production, are examined as well as their limitations and the lack of resources that stand in the way of carrying out these development programmes. This involves a study of individual holdings constituting the village, examining their crop production programme and making recommendations to the farmers on improvements and giving facilities for them to adopt these improvements.

These two villages thus serve as pilot villages for the execution of a comprehensive agricultural extension programme. In the two villages preliminary survey data have been collected for the preparation of Village and Farm Production Plans.

Demonstrations.—Apart from the Pilot Village Project, the following research achievements were chosen for test and demonstration in farmers' fields.

- (i) The use of Boron for increasing groundnut yields.
- (ii) Inoculation of green manure seeds with bacterial culture to improve nitrogen fixation.
- (iii) Foliar application of urea on ragi crop.
- (iv) Pre-treatment of paddy seeds in potassium phosphate solution.
- (v) Weed control through use of herbicides.

In all, twenty demonstrations were conducted. The demonstrations laid out are in various stages of progress.

Audio-visual aids and other publicity material like posters, three dimensional exhibits, etc., were also outlined and prepared for use in exhibitions.

Solving problems of farmers.—During the year 172 problems were received from 79 officers and together with the problems received during the previous year, the total number of problems received totalled 279. Necessary particulars and information were furnished for 253 problems and the remaining 26 problems are under review. The problems related to a variety of subjects, but many emphasised the need for evolution of new strains of crops to meet special tracts, soil reclamation, fertilizer practices and control of pests and diseases.

Survey.—The following surveys initiated during the previous year were continued during the period under report.

- (1) Survey to assess the spread of improved strains of millets in the State.
- (2) Survey to assess the quality of seeds produced in the State Seed Farms and Village Seed Farms.
- (3) Survey to assess the proper distribution of seeds and to see the wastage if any in the use of improved seeds consistent with the programme of Seed Multiplication and Distribution.
- (4) Survey to estimate the spread of the Japanese Method of Paddy Cultivation.

In addition to the continuance of the above items of survey, a survey to assess the spread of improved ploughs and demand for improved implements was taken and completed during the period under report.

The survey to estimate the area under improved strains of millets in the State is in progress. So far replies have been received for about 20 per cent of the villages where the survey has been programmed.

A detailed report on the results obtained from the survey to study coverage of improved seeds of paddy, wastage, storing conditions and germination capacity of paddy, Village Seed Farm Seeds was submitted. The results of the survey revealed that on an average the coverage of the village seed farm seeds was 48 per cent and one half of the expected quantity of the village seed farm seeds was distributed. The purity and germination capacity of village seed farm seeds were as good as State Seed Farm Seeds. Generally the ryots are now willing to purchase village seed farm seed as readily as they would do State Seed Farm seeds but the survey proved that the quality of village seed farm was good if not better than the State Seed Farm seeds and therefore they need not have any misgivings on quality.

The instructions and questionnaire forms relating to survey for estimating the area under Japanese method of paddy cultivation were issued to the Agricultural Demonstrators and the Agricultural Extension Officers. This survey is to commence from 1st July, 1961 and to be completed by 30th June, 1962.

The survey conducted for assessing the spread of improved ploughs and demand for improved implements was completed. The preliminary findings showed that 45 per cent of the ryots are having improved ploughs. Among the improved ploughs, the mould board plough and borse plough were found to be equally popular. During the year 1960 about 18,000 implements were distributed by 266 officers, and based on this survey the total number of implements distributed throughout the State by all officers would be approximately be 21,000 plough, in addition to private sale.

The immediate annual requirements of implements for the whole State was estimated as 31,000 improved ploughs including borse ploughs, 1,000 Ridge ploughs, 3,000 Burmese Suttens, 6,000 Japanese Inter-cultivators, 200 Junior Hoes and 1,000 tractors.

IV. SEASON.

South-West Monsoon Period (June to September, 1960).—The distribution of rains during this period was uneven in the State and varied widely from the normal. The districts of Chingleput, North Arcot, South Arcot and Thanjavur, received good rains. The districts of Salem, Coimbatore, Nilgiris and Tiruchirappalli and the the northern half of Madurai district and

Ramanathapuram district received normal rains, in total, but, the distribution was not favourable for crops. Tirunelveli and Kanyakumari districts received good rains, which were slightly above normal. Rains were generally very low in August and the crops, in general, suffered for lack of rains.

North-East Monsoon period: (October to December, 1960).— The conditions improved during the North-East Monsoon period throughout the State, except in Tiruchirappalli district. The coastal districts of Chingleput, South Arcot and Thanjavur received very heavy rains during November, affecting paddy and groundnut crops. Except Tiruchirappalli, all other districts received rains fairly above normal. This helped to fill up the tanks and reservoirs and also to revive dry land crops affected by drought. But the rains affected cotton crop in both dry lands and garden lands in the State.

Dry Weather Period (January and February, 1961).— During January, 1961, South Arcot and Thanjavur districts received unusually heavy rainfall, affecting Samba paddy harvests. In Chingleput and North Arcot, rains were just below normal. In the remaining districts rainfall was fairly above normal. During February, the rains were above normal in Chingleput, South Arcot, Salem, Coimbatore, Kanyakumari and the Nilgiris districts but the distribution was uneven. In the other districts rainfall was below normal.

Hot Weather period (March 1961 to May 1961).— During March, 1961, only in Kanyakumari district rains were above normal. In the districts of Madurai, Ramanathapuram, Tirunelveli and the Nilgiris rains were below normal. In the remaining districts, generally dry weather prevailed. This dry weather was favourable for harvest of crops. Rainfall was above normal in the remaining districts, except in parts of Tirunelveli district. In North Arcot district several tanks dried up. During May, 1961, rains were below normal in Chingleput, South Arcot and portions of Thanjavur, Ramanathapuram and Tirunelveli districts. In the remaining districts, fairly good rains were received but the distribution was uneven. The South-West Monsoon broke along the West Coast on 22nd May 1961 and heavy rains were received in the Nilgiris during the last ten days of the month.

June 1961.—The South-West Monsoon started in the fourth week of May this year, thus augmenting the supply of water to the Irrigation Projects.

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

TARGETS AND ACHIEVEMENTS 1956-61.

The following are the targets fixed under the Second Five-Year Plan and achievements made during the Five Years of Second Plan period :—

(1)	1956-57 target production potential	1956-57 (Achievement)	1957-58 (Achievement)	1958-59 (Achievement)	1959-60 (Achievement)	1960-61 (Anticipated)	Total (in thousands tons)
(A) Food production—							
1 Major Irrigation ..	90.0	0.16	33.7	17.7	19.8	20.5	107.7
2 Minor Irrigation ..	110.0	17.6	13.9	17.0	29.0	30.9	108.4
3 Land Development.	55.0	8.1	6.5	3.1	3.1	3.9	24.7
4 Fertilizers and manures.	606.0	137.8	64.6	69.0	71.0	(—) 19.9	323.4
5 Improved seeds ..	390.0	(—) 17.4	56.4	(—) 8.5	45.8	(—) 10.4	65.9
6 Improved Agricultural practices.	30.0	4.24	33.7	84.0	35.7	57.8	253.6
Total ..	1,279.0	204.5	208.8	182.3	205.3	92.8	888.7
(b) Commercial crops—							
1 Oil seeds ..	2.66	0.15	0.26	0.67	1.20	2.35	2.35
2 Sugarcane ..	10.00	1.77	2.37	2.17	2.37	3.04	11.72
3 Cotton (Bales) ..	1.55	0.32	0.61	0.65	0.88	0.34	0.84*

* Up to March, 1961.

RESEARCH, EDUCATION AND INFORMATION SCHEMES.

No physical target.

The following are the main reasons for the shortfall under Land Development, Fertilisers, Manures and Improved Seeds :—

(i) Difficulty in procurement of tractors spares parts, equipment, etc., due to the revised import policy of the Government of India and the foreign exchange position.

(ii) Short supply of ammonium sulphate and other chemical fertilisers.

(iii) Adverse seasonal conditions in some areas.

Under Cotton, though the cotton season extends upto end of July, 1961, the figures of achievement have been reckoned only upto end of March, 1961, so as to adopt a uniform period for review of targets and achievements under the agricultural production schemes.

Financial Achievements.—At the time of formulation of the Second Five-Year Plan, a sum of Rs. 468.86 lakhs was alone provided. Subsequently, the following schemes which were not originally included in the plan were also brought within its purview as per Government Memorandum No. 54588/Plg./58-2, Finance (Planning Department), dated 23rd May 1958. The expenditure was proposed to be met from the savings expected due to non-execution of certain schemes and by diversion of surplus funds from other sources. The financial outlay in respect of these schemes is also indicated against them :—

Name of the Scheme.	Cost Rupees in lakhs.
1 Dusters and Sprayers	6.13
2 Local Manurial Resources	10.06
3 Nightsoil Compost	18.39
4 Pilot Scheme for destruction of rats	0.05
5 Road Development Scheme	16.15
6 Coconut Research Station, Thanjavur	1.84
7 Kazhuveli Swamp area	0.42
8 Parasite Breeding Station	0.48
9 Increasing Coconut Oil Production	1.01
10 Coconut cultivation in Ramanathapuram	0.55
11 Model Orchard cum Nurseries	2.01
12 Post Graduate Research Institute	7.66
13 Tobacco Development in Kanyakumari	0.44
14 Manurial Trials on ryots fields	1.11
15 Sugarcane Zonal Farms	0.92
16 Regional Research Fruit Station	2.40
17 Banana Research	1.43
18 Model Agronomic Experiments at Agricultural Research Station, Aduthurai and Bhavani- sagar.	0.65
19 New Research Scheme	4.97
20 Lift irrigation Hire Scheme	2.86
21 Lift irrigation Hire Purchase	(—) 2.36
21 Tractor Hire Purchase Scheme	1.92
Total	79.89

The achievements made under the following schemes which were in operation during the year 1960-61 are furnished in Appendix 6.

A. AGRICULTURAL PRODUCTION.

- (1) Opening of State Seed Farms.
- (2) Supply Schemes :—
 - (i) Distribution of green manure seeds.
 - (ii) Supply of improved seeds of paddy and millets.
- (3) (i) Control of pests and diseases of crops and plant protection.
- (ii) Distribution of dusters and sprayers.
- (4) Pilot scheme for destruction of rats.
- (5) Japanese method of paddy cultivation.
- (6) Urban Compost Scheme.
- (7) Development of local manurial resources.
- (8) Development of Night Soil Compost in Bigger Panchayats.
- (9) Scheme for manufacture of Rural Compost.
- (10) Pilot Scheme for development of Night Soil Compost in Smaller Villages.

Development of Commercial Crops.

- (1) Horticultural Development Scheme.
- (2) Scheme for establishment of more Regional Orchard-cum-Nurseries.
- (3) Establishment of small-scale Fruit Preservation Units.
- (4) Scheme for training of mails (Gardeners).
- (5) Increasing production of oil-seeds.
- (6) Development of Cashew cultivation (a) Non-forest areas.
- (7) Sugarcane Development Scheme.
- (8) Road Development in sugar factory areas.
- (9) Increasing Cotton Production.
- (10) Coconut Research Station, Thanjavur.
- (11) Establishment of Coconut Nurseries.
- (12) Scheme for the establishment of a parasite breeding station for biological control of *Nephantis Scrinopa*.
- (13) Scheme for establishment of Demonstration Coconut plantation on the Kazhuveli Swamp Area in Tindivanam taluk (South Arcot) and Uchipulli in Ramanathapuram district.
- (14) Scheme for Development Coconut cultivation in Ramanathapuram District.
- (15) Scheme for increasing Coconut Oil production.
- (16) (a) Research Scheme on Meenampalayam Tobacco.
- (b) Jaffna Tobacco Development in Kanyakumari district.
- (c) Comprehensive Tobacco Development Scheme.

Agricultural Education.

- (1) Strengthening of Agricultural College, Coimbatore.
- (2) Scheme for upgrading the Agricultural College and Research Institute, Coimbatore :—
 - (i) Formation of Statistical Section.
 - (ii) Provision of X-ray Unit.
 - (iii) Purchases of technical books and farm equipment.
- (3) Scheme for developing the Agricultural College and Research Institute, Coimbatore, into a Regional Post-Graduate Research Institute.

Agricultural Research Information and Statistics.

- (1) Agricultural Information Service.
- (2) Scheme for investigation of betelvine wilt.
- (3) Research on gur manufacture and storage.
- (4) Scheme for manurial trials on ryots' fields.
- (5) (a) Sugarcane Research Station.
- (b) Sugarcane Zonal farms.
- (6) Regional Research Station of fruits.
- (7) Scheme for Banana Research.
- (8) Scheme for Model Agronomic Experiments at Agricultural Research Station at Aduthurai Station and Bhavanisagar.
- (9) Experimental Research Station in Amaravathi Canal area.

New Schemes included in the plan.

- (1) Research on Grapes and related wild species.
- (2) Improvement of off-seasonal bearing mango.
- (3) Evolution of new varieties of Dolichos lab. lab.
- (4) Study of nitrogen fixing blue-green algae in rice soils.
- (5) Evolution of draught resistant strains of Sorghum.
- (6) Evolution of draught resistant strains of paddy.
- (7) Scheme for evolving Pyricularia resistant strains of paddy of different durations.
- (8) Stem rot disease of Rice.
- (9) Evolution of saline and alkaline resistant strains of paddy.
- (10) Evolution of paddy strains for inundated areas.
- (11) Chemical investigation of the cause of blast resistance in paddy.
- (12) Rice stem Borer.

- (13) Short-term rice strains possessing seed dormancy.
- (14) Micro-nutrient studies in crop plants.
- (15) Rationalisation of Research Stations.
- (16) Establishment of Rural Economics and Sociology Station, in the Agricultural College and Research Institute, Coimbatore.
- (17) Scheme for Co-ordinated Manurial Trials on Groundnut.
- (18) Scheme for Pest Protection Measures on Oil-seed crops.
- (19) Establishment of an extension Section at the Agricultural College and Research Institute, Coimbatore.

B. LAND DEVELOPMENT.

- (1) Tractor Hiring Scheme.
- (2) Tractor Hire Purchase Scheme.

Head of Development—Minor Irrigation.

- (1) Sinking of Tube Wells and Artesian Wells.
- (2) Filter Point Tube Wells.
- (3) River Pumping Scheme.
- (4) Lift Irrigation (Hiring) Grow More Food scheme.
- (5) Lift Irrigation Hire Purchase Scheme.

Head of Development—Forests and Soil Conservation.

- (1) Soil Conservation in Agricultural Lands.

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

(a) The objective of agricultural development in the Third Five-Year Plan of this State is to increase Agricultural Production by 88 per cent during the next five years. This could be achieved by proper planning and for this necessity for the preparation of village production plans as part of the Agricultural Development Plans has been emphasised. Under the Muzrai Panchayat Act, 1958, Panchayat Unions are being constituted to cover the Rural areas of the State. Items of work relating to agricultural development will be the responsibility of the Panchayats and the Panchayat Unions.

In G.O. No. 8792, Food and Agricultural, dated 16th November 1960 detailed instructions have been issued for the preparation of village production plans and accordingly production plans are

being prepared for all the Panchayat Unions. Emphasis has been laid on the development of local manures and multiplication and distribution of improved seeds. Essential features in the preparation of the village production plan are: (1) ascertaining the local manure units at present being used in the village for grain crops, the number of units to be used as the optimum and determining the deficiency which requires to be made good in order to increase the production of foodgrains, (2) determining the form in which the deficiency is made up, arranging the supply of green manure seeds, raising of green manure crops and fixing the quantity of compost to be prepared, (3) with the object of changing the seed once in three years in every field, fix up strain of seed required, determining the quantity and arrange the supply of seeds, (4) selection of Gramasahayaks for rendering the service of multiplication and distribution of these seeds by raising the crops in their own lands.

The technical control of the Block vests with the District Agricultural Officer while the Administrative Controlling Officer is the Block Development Officer. There was one Agricultural Extension Officer in each Block assisted in addition to the ten Gramasahayaks provided under National Extension Scheme by one fieldman and two demonstration maistries. In each block, there was one Agricultural Depot with one lower division clerk. There are 239 blocks including Community Development stages I and II, as on 1st July 1961.

The particulars and achievements under various schemes in the areas covered by National Extension Scheme are given in Appendix VIII.

(b) *Intensive Agricultural District Programme.*—The Intensive Agricultural District Programme, popularly called Package Programme was inaugurated in Thanjavur district on 13th April 1960 but actually went into operation in June 1960, with commencement of the kuruvai season. The programme envisages intensification of agricultural production in selected areas phased over five years. Individual Farm Production Plans are to be prepared for each cultivator in the area indicating the full requirements of supplies, and credit and providing necessary technical advice. The programme is partly financed by the Ford Foundation and partly by the Central and State Governments.

The intensification of Agricultural production includes also provision for effective market service, village improvement including Co-operation Societies and Panchayats, Livestock Development and Local Programme.

In 1960-61, the programme covered 228,871 acres in 317 villages in 23 Community Development Blocks and in 1961-62, 343,048 acres in 464 villages in 26 Community Development

Blocks. The programme in 1961-62 includes also other crops besides paddy which was the only crop included in 1960-61 programme. The required organisation in Agricultural Co-operatives and Community Development were strengthened and statistical organisation was set up for bench mark and evaluation survey. Extra depots for supplies, co-operatives for credit and godowns for storage were set up; local work of silt clearance was taken up as an experimental measure in Papanassam and Kivalur blocks as part of the Panchayat Programme.

Form Production Plans for 36,682 farmers were prepared in 1960-61 (June 1960—March 1961) and 53,325 (for April-June 1961) soil analysis was done for 850 soil samples, two exhibitions were held, 3,270 scientific demonstrations were conducted. An additional production of 12,971 tons of foodgrains is expected to have been obtained as a result of the supplies effected under the Programme, as given below:—

	Tons.	Estimated additional production (tons)
Distribution of ammonium Sulphate ..	2,830	5,660
Distribution of super phosphate ..	2,356	2,356
Distribution of improved seeds ..	..	..
Distribution of green manure seeds ..	189	2,835
Distribution of pesticides ..	212	2,120
Total ..		12,971

VII. SPECIAL FEATURES OF THE YEAR.

1. *Aerial Spraying.*—In G.O. Ms. No. 1320, Food and Agriculture, dated 10th April 1961, the implementation of a Pilot scheme of aerial spraying of insecticides to control the spread of red hairy caterpillar pest on the groundnut crop in Pollachi taluk over an area of 10,000 acres was sanctioned. The Pollachi taluk in Madras State has the largest area of 125,000 acres under groundnut cultivation which subject to severe damage every year by the red hairy caterpillar pest. As the infestation of the pest usually occurs over vast areas it could not be effectively controlled by the use of hand operated machinery. Hence it was decided to attempt aerial spraying on a pilot scale as a method of effective control of the pest. Aerial spraying was organised with the active collaboration of the Plant Protection Directorate, Government of India, who provided one Beaver aircraft for the operations. Two private 'Auster' aircrafts were also engaged in the spraying operations. The spraying lasted from 21st May to 8th June 1961 covering a total area of 8,213 acres. In spite of unfavourable seasonal conditions and high velocity of winds which

hampered the spraying operations, very often the results achieved in average and effectiveness of spraying should be considered quite good. There was cent per cent mortality in the case of young caterpillars and 50 to 85 per cent mortality in the case of medium seized caterpillars. Aerial spraying with Endrex (E.C. 20) at 10 oz. in two gallons of water per acre was found very effective in the first ten days of the operation when the caterpillars were less than 15 days old. The actual cost of spraying also worked out to a comparatively small amount of Rs. 5.31 per acre, excluding half the cost of pesticides which was met by Government.

2. *Entrusting responsibility for agricultural production to the panchayats and panchayat unions.*—It has been laid down that the objective should be to increase the production of foodgrains by 33 per cent during the Third Five-Year Plan period. This has to be achieved by suitable village production plans as part of village agricultural development plans. Till 1st October 1960, there was no suitable organisation at the village level which could undertake the responsibility for the preparation and execution of the plans. As per the provisions in the Madras Panchayat Act, 1958 the first batch of 75 Panchayat Unions was constituted on 2nd October 1960. This marks a mile stone in the development of agriculture. The second batch of Panchayat Unions covering 131 blocks was constituted on 14th April 1961. This brings about 60 per cent of the area in the State under Panchayat Union. Responsibility for carrying out the Agricultural Production Programme has been fixed on the Panchayat and Panchayat Unions. Village Production Plans are to be drawn up and attainment of self-sufficiency in the matter of organic manure and improved seeds will be the responsibility of the Panchayat and the Union. For this purpose an amount of Rs. 2 lakhs as agricultural grants has been provided in the Panchayat Schematic Budget. This amount is exclusive of the cost of extension of staff whose services are placed at the disposal of the Panchayat Union, free of charge and also exclusive of loans and short-term credit made available to the cultivators by Government and Co-operative Agencies.

In G.O. Ms. No. 664, Rural Development and Local Administration, dated 16th August 1960, it has been laid down that out of the sum of Rs. 2 lakhs provided as Agricultural grant, a sum of Rs. 1 lakh would be distributed among the Panchayats of each Panchayat Union as a matching grant to be utilised for certain specific purposes and another sum of Rs. one lakh to the Panchayat Union for certain other specific purposes as a non-matching grant.

The formation of these Panchayat Unions and enlisting the active co-operation of the Village Panchayats in the formulation and carrying out of Agricultural Production Programmes are bound to go a long way in attaining the goal of 33 per cent increased production at the end of Third Five-Year plan.

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.

Central Office.—The scheme for the centralisation of the offices of the various research sections at 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. As per centralisation, the Dean, who has been declared to be the Head of Office as well as the Head of the Institution, continued to have administrative control over the Central Office, Agricultural College and Research Institute, Coimbatore, dealing with all matters pertaining to establishment, accounts, stores, etc., which were previously dealt with by different Heads of Sections. The Associate Dean assisted the Dean in the work relating to education of graduates and Post-Graduates and also in accounts work. The post of Administrative Officer and Junior Accounts Officer continued to be in existence to assist the Dean in administrative and accounts matters.

1. RESEARCH COUNCIL.

During the period under report, 16 meetings were held for scrutiny of research programmes, progress reports and miscellaneous items pertaining to research. Sri A. H. S. Sarma, Extension Specialist acted as Secretary, Research Council.

2. AGRICULTURAL CHEMISTRY.

A. Soil Science.

(a) *Effect of indigenous soil conditioners on the soils of Madras State.*—During the period under report, studies on the effect of indigenous soil conditions on the alkali soils were studied. Pot culture experiment with tamarind seed powder, saw dust and paddy husk were applied at $2\frac{1}{2}$ per cent, 5 per cent and 10 per cent level by weight. For comparison, synthetic soil conditioner 'Krillium' and 'Aerotil' were included at 0.1 per cent level. Soils samples were collected periodically at three weeks interval and the moisture level was maintained at 30 per cent. The results of the analysis indicated favourable influence in the case of tamarind seed powder at 2.5 per cent and 5 per cent level. Reduction in PH was conspicuous.

The effect of indigenous soil conditions on crop growth was studied with ragi in the above treatments. Two sets of experiments were carried out with and without basal dressing of cattle manure. It is seen, that the crop growth and yield is superior in tamarind seed powder treatments. Application of basal dressing of cattle manure enhanced the yields further.

Though the cost of tamarind seed powder is less in comparison with the soil conditioners like 'Krillium' and 'Aerotil' yet this is costly considering the quantities that need to be applied and the other purposes for which tamarind seed powder is in demand.

(b) *Effect of different cations on the physico chemical properties of the major soil types of the Madras State.*—Two alkaline soil samples—one from Paramakudi and another from Tiruchendur representing slightly alkine and highly alkaline soils respectively were taken for this study. Physico-Chemical properties like real and apparent specific gravity, water holding capacity, pore space volume expansion, dispersion, co-efficient, moisture equivalent and PH of the original soils as well as in hydrogen, calcium, sodium, magnesium and potassium soils were determined. Mechanical analysis of the original soils was also done. Hydrogen, calcium, magnesium, sodium and potassium soils were prepared from the original soils by leaching them with W/2 solutions of hydrochloric acid, calcium chloride, magnesium chloride, sodium chloride, potassium chloride respectively. The physico-chemical properties of the leached soils were studied in comparison with those of the respective original soils. Mechanical analysis shows that the Paramakudi soil is a clayey soil and Tiruchendur soil is sandy in nature. Hydrogen, calcium and magnesium ions reduced the high dispersion co-efficient of the alkaline soils to a remarkable level. Calcium and magnesium ions tend to reduce the PH of the highly alkaline soils towards slight alkalinity and hydrogen ions brings the PH to acid stage. The water holding capacity of the

alkaline soil has been increased in all the cases but in the case of Tiruchendur soil it has been increased except in the case of Hydrogen clay. There is no wide variation in the apparent or real specific gravity of both the soils. There is a slight decrease in the case of Mg. and in all other cases there is a slight increase in real specific gravity. Ca. and Mg. have got very good flocculating capacity as seen from the Paramakudi soil. Sodium however deflocculates the clay, it practically doubling the dispersion coefficient of Paramakudi soils. In the case of Tiruchendur the sodium soil has slightly higher dispersion coefficient than that of untreated soil. Here also Ca. and Mg. have got flocculating effect which was pronounced. Magnesium appears to have a better flocculating effect than Ca. Ca. and Mg. have also the tendency to reduce the soil PH. This effect is seen very clearly in the Tiruchendur soil where the original PH. was 9.6 whereas the Ca. and Mg. soils have recorded only 8.4. So this study indicates that not only Ca. as gypsum but also Mg. may be used for reclaiming alkali soils whereas Potassium and Sodium have got the tendency of deflocculating the clay as well as to render the soil more alkaline or saline.

(c) *Anion Exchange Studies.*—The object of the study is to study the factors which make phosphate available to plant through anion exchange. It is the reversible substitution of one anion for another. The Anion exchange capacity was estimated for four types of soils (lateritic, wetland soil, black cotton soil, red soil) by piper method. It was found that the exchange capacity was higher in wetland soils (18.16 m.e./100 gm. of soil) and lateritic soils (16.58 m.e./100 gm. of soil) than Red and Black Soils (7.10 m.e./100 gm. of soil and 9.90 m.e./100 gm. of soil).

To study the factors which make phosphate available to plants through anion exchange, a pot-culture experiment using lateritic soils was conducted. There were ten treatments including super applied alone and in combination with silicate, chloride and hydroxylions. Samples were drawn periodically and analysed for pH, available phosphate, exchangeable phosphate, and total anion exchange capacity.

Silicate at 3,000 lb. acre has increased the pH from 4.8 to 5.3. The available phosphate has been increased by the application of chloride and silicate ions. There is no regular variation in total anion exchange capacity due to various treatments. Superphosphate alone, has increased total anion exchange capacity. To find out the effect of organic manures on the exchangeable and available phosphate another experiment was conducted on lateritic soils using Farm Yard Manure and green manure in combination with super. Samples were drawn periodically as before and analysed for pH, available and exchangeable phosphate and total anion exchange capacity. Green manure alone, has increased the pH throughout the period of the experiment. Farm

Yard Manure has increased the pH initially but at the end there is no change between control and this treatment. Available phosphate has been increased by the Farm Yard Manure application throughout the experiment but the exchangeable phosphate is found to be more in both the cases (Farm Yard Manure application and Green manure application). There is no variation in the total exchange capacity due to various treatments.

The above experiment using black soil is under progress.

(d) *Role of calcium in the fertility of South Indian Soil types.*—Digerent soil types, viz., red, black, mixed, alluvial, lateritic, saline and alkaline collected from different research stations and other places of Madras State, were analysed for their complete chemical and physical composition. The available potash, available phosphoric acid and lime, the physical constants, water holding capacity, volume expansion and pore space were also determined. The lime content of black soil of Koilpatti is very high compared to other types of soils while the red soil of Koilpatti and Alluvial soils of Tirurkuppam, Palu and Aduthurai have got medium calcium content, ranging from 0.67 to 0.70 per cent Ca. O. The calcium status of red soils of Tindivanam, Kanyakumari and the lateritic soils of Nilgiris is very low ranging from 0.09 to 0.25 per cent Ca. O. Total base exchange capacities of black soils of Koilpatti and Aduthurai are 45 m.e./100 gm. of soil and 24 m.e./100 gm. of soil respectively. The base exchange capacity of red soils of Koilpatti and Alluvial soils of Palur and lateritic soils of Nilgiris ranges from 12 to 14 m.e./100 gm. of soil, while the red soils of Tindivanam and Kanyakumari and sandy soils of Pattukottai give below 10 m.e./100 gm. of soil. The exchangeable calcium is more in the case of black soils of Koilpatti than other soils.

(e) *Reclamation of Saline and Alkaline Soils.*—With a view to find out the best ameliorant which will be quick and economic in the reclamation of saline and alkaline lands, field experiments were conducted at the following three centres. Kallarmozhi (Tirunelveli district), Nemmeni (Ramanathapuram district) and Veerapanian (Madurai district). Soil ameliorants like green manure, farm yard manure, gypsum and molasses alone and in combination were applied. The dosages of the ameliorants applied were as follows: Green manure at 2,500 lb. and 5,000 lb. per acre, farm yard manure at 5 and 10 tons per acre, gypsum at 2, 4 and 6 tons per acre, and molasses at 4 tons per acre.

The yield of Daincha at Kallarmozhi indicated that treatment 5,000 lb. of green manure per acre recorded significant higher yield than to other treatments. The yield of paddy at Nemmeni though statistically insignificant indicated that Green manure treatment at 2,500 lb. acre recorded higher grain and straw yields than other treatments. The decrease in yield of grain at

Nemmeni compared to the results of previous years appears to indicate, that the residual effect of gypsum does not last beyond two years and has even a tendency to depress the yield, indicating the need for fresh application of gypsum. Fairly high yield on control plot at Nemmeni indicated that more bunding, flooding, draining and adoption of normal cultivation practices were equally effective in gradually reclaiming the alkaline soils. However the chief obstacle for complete reliance on leaching as a means of reclamation will be due to the slow rate of water penetration through the alkaline soils. At Veerapanian, gypsum treatment at 4 and 6 tons per acre recorded higher grain and straw yields, than the other treatments.

Pot culture studies conducted to test the efficacy of Argemone Mexicana over Daincha (the commonly applied green manure to alkaline soils) indicated that both the green manure treatments were equally effective in recording higher yield than control. As the pot culture experiments was vitiated due to stem borer attack much reliance could not be placed on the results. However, the field observation plots conducted with Argemone Mexicana showed that higher grain and straw yields were obtained at 5,000 lb. level application rather than at 2,500 lb. per acre. In the field observation plot, Argemone Mexicana at 5,000 lb./acre recorded higher yield than green manure at 5,000 lb./acre. Farm yard manure and molasses treatments gave lower yield than green manure at 2,500 lb./acre or gypsum treatments.

The laboratory analysis of Kallarmozhi soils indicated a general reduction in PH, electrical conductivity and water soluble salts when compared with the values of soil samples collected from the profile examined prior to the lay out of the experiment. G. M. at 5,000 lb./acre recorded low pH and E.C. The Nitrogen and Phosphoric acid status of soils are generally poor and the soils are in need of heavy nitrogenous and phosphatic manuring.

The analysis of drainage water from pot culture experiment indicated that during flooding, leaching and draining, green manure treatments (Daincha and Argemone Mexicana) were more effective in inducing the removal of more of water soluble salts from the soil, than control. Argemone Mexicana treatments at 5,000 to 2,500 lb. level per acre were observed to carry away more of water soluble salts from the soil through drainage water than Daincha treatment.

The results of the experiments conducted during 1960-61 clearly indicate that application of green manure at 5,000 lb. per acre and gypsum at 4 and 6 tons per acre were remarkably effective in recording higher yield and in reclaiming the alkaline soils. The residual effect of gypsum was observed to last not beyond two years and had even a tendency to depress the yield thereafter. Hence application of gypsum at an interval of two years appears to be necessary.

(f) *Soil Survey of the Amaravathy Project.*—Soil Survey and Soil Classification in Amaravathy Reservoir Project area started in April 1959, was continued during 1960-61 also. A rapid soil survey conducted in 1959-60 was followed up during this year by detailed soil examination in the field as well as in the laboratory.

The field studies have shown :—

(1) The parent material of the soils have been derived from gneisses of the archean age. The gneiss is feldspatic in Udumalpet and hornblendic in Dharapuram taluks.

(2) The climate is semi-arid, with 20 inches of rainfall falling mostly during the north-east monsoon season.

(3) The topography is undulating. The drainage in the valleys occurring between the spurs (top of the undulations) is only moderate. The water table in these valleys rise to the ground level during the irrigation season.

(4) Under the influence of the undulating topography a sequence of soils ranging from the typical red earth or red loam (latosol) to their halomorphic or hydromorphic variants are recognised in a traverse from the crest of the ridge to the floor of the adjacent valley. The latosol or the crest (high level areas) in Dharapuram taluk has Kankar (Calcium Carbonate) in the surface and subsoils while that of the Udumalpet taluk has Kankar occurring only deep in the profile. The Halomorphic and Hydromorphic soils of the valleys are the different phase of the red earths caused by the bad drainage and high water table obtainable in the valleys.

The soil samples collected during field work were analysed in the laboratory for texture, salinity status, pH, dispersion coefficient and permeability. Other tests such as nutrient status, base exchange capacity, moisture characteristics etc., are in progress.

The tests clearly bring out that in the entire ayacut area soils at all depths are of a light texture (sandy loam). The values for total soluble salts, pH, Dispersion coefficient, and permeability indicate that the high level areas are only moderate by drained but well suited for the salt resistant crops like cholam, cotton, ragi, tobacco, etc. The low level areas have the same or lower concentration of soluble salts but toxic amounts of carbonate ions present in them limit the growth of paddy and sugarcane. These soils are however reclaimable by improvement in drainage.

The following table summarises the field and laboratory observations. It also gives the average irrigable values for the soil classes and their variants in the ayacut. Irrigable values are indices for the response that may be expected for irrigation in the area.

Taluk.	Location.	Soil profile.	Average salt per cent.	Average irrigable value.
(1)	(2)	(3)	(4)	(5)
Udumalpet	High level area.	Generally 30" of soil free from undesirable layers such as hard pan, etc., resting on gravelly layers—Permeable.	0.27	III
Udumalpet	Low level area.	Generally less 30" of soil resting on impermeable layers on temporary high water table—reclaimable.	0.29	III
Dharapuram	High level areas.	Generally 30" or less of soil mixed with kankar nodules and rock fragments but free from undesirable layers such as hard pan, etc., resting on gravelly layers.	0.13	III
Dharapuram	Low level areas.	Generally 30" or less of soil resting on impermeable layers on temporary high water table—reclaimable.	0.18	III

The low rating in point of irrigation suitability for these soils has been caused chiefly by the improper soil depth and drainage in the area. According to the cropping programme for the area, most of the higher level areas lying adjacent to the canal are to be grown to dry crops requiring only light irrigation. But in actual practice paddy is being cultivated in many such areas. There is also extensive seepage from the canal. These have added to the drainage problem in the Valleys which are often water logged during the irrigation season. In order to overcome this difficulty the canal should be lined atleast in portion where there is too much seepage, and strict adherence to the cropping programme should be insisted upon. A general improvement in the existing drainage system and its maintenance in good repair are also of paramount importance for the permanence of irrigated agriculture in the tract.

(g) *Soil Survey of the Parambikulam Project.*—The Scheme for the Reconnaissance Soil Survey of the ayacut area of the Parambikulam Aliyar Project, was implemented on 5-3-1960. The following is the summary of work done in the scheme during the period 1st July, 1960 to 30th June, 1961. During the period under report, 27 profile pits were examined in the entire ayacut area and from them 107 soil samples were drawn for laboratory studies. Four surface soils were also collected for study. In addition 172 water samples were collected from the ayacut area distributed in the four taluks of Pollachi (86) Udumalpet (39) Palladam (37) and Dharapuram (10).

Among the soils drawn, 61 soils were analysed for mechanical composition, 71 for soil alkalinity and 12 for Chemical analysis. In 149 water samples the total salts and the nature of salts were determined.

In general the soils of Udamalpet taluk are much heavier than those of Pollachi taluk. In Pollachi taluk, the surface soils contain about 5 to 23 per cent of finer fractions (clay and silt), while in Udamalpet taluk the finer fractions range from 9 to 36 per cent. Black and Red soils occur side by side in the ayacut. The soil colour is the resultant of the prevailing climate, drainage and parent material. Though the climate is the same in the entire area, the drainage conditions and parent material vary considerably. Because of the intermittent wet and dry periods and impeded drainage, grey soils might have formed, while the Red soils might have formed under perfect drainage conditions.

The black soils of the area occur mostly in Udamalpet taluk, and in the Pollachi taluk on the eastern side along the taluk boundary. The black soils occur mostly in Dhali, Gomangalam, Nagpur, Chandrapuram, Sultanpettai, Aruppatti, Upparodai, Krishnapuram, Kammlapatti and West of Udamalpet and need demarcation for special attention. Except in certain areas, most of the black soils are deep. In these areas any condition or conditions, combination of that allow the salt to accumulate resulting in saline soils should be avoided. One of these conditions is frequent and high irrigation when little or no salt is being flushed out of the soil. Water application to light, slowly permeable soils will result in a high water table. Soils that cannot be flushed out and drained readily and soils that contain high amounts of water soluble salts should not be irrigated for long periods of time with water high in salt. For the prevention of salinity, application of sufficient water will be necessary. Water applied must be sufficient to flush out the salts left from previous irrigation. The range of total water soluble salts in the soil in the Pollachi taluk is from 0.01-0.4 per cent, while in Udamalpet, it is from 0.02 to 0.08 per cent. In Pollachi taluk, the increase in water soluble salts in the soil with the increase in depth is from 0.01 per cent to 0.4 per cent; while in Udamalpet taluk, it is from 0.02 to 0.8 per cent. In certain areas having high Calcium state to avoid calcium induced chlorosis certain remedial measures may have to be adopted.

Soil erosion due to water and wind is the most active destroyer of soil fertility and soil depth in a number of areas. It appears that in some areas the entire 'A' horizon has been swept away due to the action of water and wind. The erosion problem is so complex that a combination of measures is needed to combat it. Cropping system and cultural operations should be aimed at maintaining covers of growing crops or under crop residues. With the introduction of canal irrigation, adequate supplies of soil moisture may be available to maintain ample cover crops and crop residue covers.

(h) *Maximisation of phosphate potential in soils of Madras State.*—Duplicate profile samples from the three different soil zones, viz., Koilpatti (Black soil), Aduthurai (Alluvial Soil) and

Nanjanad (Latosol) were collected and have been analysed for chemical constituents, available nutrients, water soluble salts, electrical conductivity and pH and the analysis was in progress.

Pot culture experiments with sunnhemp and ragi crop were conducted at Coimbatore with two doses of P_2O_5 , viz., 30 lb. and 60 lb. P_2O_5 per acre and two types of phosphate (rock phosphate and super-phosphate) with and without Farm Yard Manure 5 tons per acre. 1. *Sunnhemp*, sown on 5th February 1961 in the pots, was harvested on 24th February 1961.

(1) The results achieved with the sunnhemp crop go to show that treatments receiving super-phosphate with or without farm yard manure are better than rock phosphate treatments and control and the treatment super-phosphate 30 lb. P_2O_5 per acre plus farm yard manure was superior to all treatments when both yield and composition were taken into account.

(2) Manuring has increased the phosphorus content of the sunnhemp crop.

(3) There was no regular variation in the potash, nitrogen and calcium content of sunnhemp crop due to manuring.

(i) *Ragi*.—The ragi seeds were sown in the nursery on 8th December 1960 and transplanted in the pots on 4th January 1961 and the crop was harvested on 6th April 1961. The yield of ragi straw was increased due to manuring and all the treatments receiving superphosphate were better than rock phosphate treated plants and the phosphate with farm yard manure gave increased uptake of phosphorus over those receiving phosphate fertilisers alone. Combinations with Farm Yard Manure increased the yield of straw only in the case of rock phosphate. Composite soil samples before manuring and after harvest have been collected for analysis.

Another set of pot culture experiments have been laid out with sunnhemp and ragi crop and the crops are being harvested.

At Koilpatti and Nanjanad, field trials and pot culture experiments respectively were in progress.

(j) *Scheme for the studies on the reversion of phosphates in the laterite soils of Nilgiris.*—The main season potato crop planted during 1959-60 in field and pot culture experiments were harvested on 17th August 1961. There were twenty-four treatments comprising six treatments of phosphates (no phosphate, super phosphate, rock phosphate, bonemeal, silico phosphate and Nanjanad mixture) X two levels of lime (0 and 7,500 lb. per acre) X two levels of compost (0 and 6,000 lb. per acre) with no phosphate as control. The yield data was statistically analysed and the results indicated that (i) the slight increase in yield by the addition of compost is not statistically significant, (ii) as regards the kind of phosphate, the Nanjanad mixture is superior and is on a par with

superphosphate. Super Phosphate is on a par with silicophosphate and these are superior to the rest, (iii) the responses to phosphate do not seem to be affected by the presence or absence of basal dressing of Farm Compost or lime or both.

After harvesting the potato crop, Lupin was raised in the plots and pots to study the residual effect of the different treatments. The crop was sown on 14th September 1960 and was harvested on 20th January 1961. The highest yield was obtained from the plots treated with Nanjanad mixture in combination with compost plus lime.

Leaf and other plant materials were collected from the crop in these pots for analysis to study the effect of different treatments on nutrient. Samples of potato leaf and tuber, Lupin leaf and whole plant were analysed.

Lime requirement of the pretreated soils was determined and it was found to be 7,500 lb. per acre to plough depth. The soil samples from the plots receiving 80 lb. Nitrogen and 100 lb. K_2O alone (receiving half of the nitrogen from 200 lbs. of Ammonium Sulphate per acre) were found to indicate a lime requirement of 10,000 lb. per acre on average.

The analysis of the pretreated soil samples (1958) and post harvested soil and sub soil samples were analysed.

For the fourth season (April—August, 1961) plots were laid out in Field No. 34 at the Agricultural Research Station, Nanjanad, on 31st March 1961. Lime and compost to the respective treatments were applied in advance of the fertiliser mixture. About 80 lb. of silico phosphate was prepared by fusing a mixture of Trichy phosphate, serpentine and sodium sulphate in the ratio of 10 : 3 : 3 in the oil fired furnace at the Tractor Workshops, Coimbatore.

Pot culture experiments for 1961 were set up on similar lines with the field treatments and potato was planted in those pots.

B. MANURING AND PLANT NUTRITION.

(1) *Permanent manurial experiments—Old Permanent Manurial Experiment.*—These plots were laid out in 1909 and the 91st crop was grown under rainfed conditions in 1960. The effect of continuous cropping on soil manured with "Cattle Manure" and artificials supplying Nitrogen, Phosphorus and Potash alone and in combination continuously year after year in the same plots is being studied. There are 10 treatments without replication. During 1960-61 (Co. 3) Tenai was sown in October, 1960 and harvested in February, 1961. The highest yield of 898 lb. acre in grain was recorded by the N plus plus P treatment. Cattle manure plot recorded 374 lbs./acre the N plus K treatment recorded 298 lbs./acre and the control recorded only 182 lb. acre of Tenai grain.

After the harvest of Tenai the field was kept fallow to be sown with cotton in August 1961.

Tenai grain and straw samples were analysed for moisture, total phosphoric acid, total potash and nitrogen. The results indicate that the nitrogen uptake was lower in the plots which had not received fertilizer Nitrogen the phosphorous uptake was better in the C.M. and C.M.R. plots as well as in plots where P was applied singly and in combination with N or K.

(ii) *New Permanent Manurial Experiment.*—This experiment is being conducted since 1923 with ten treatments as in O.P.M. experiment. There are two series in this experiment. In one series eight plots receive a basal dressing of cattle manure while the other does not. The crops receive irrigation. So far 58 crops have been raised. During the year under report cotton (M.C.U.I.) was sown in September 1960. The crop received six irrigations and was affected by pests for which foliol spraying was given twice, one at the initial stages and the other during boll formation. Picking of cotton kapas was started in January 1961, and extended upto April, 1961. Totally 10 pickings were made and the yield was separately recorded and finally totalled up. The highest yield of 1108 lb./acre was recorded by 'Cattle Manure treatment followed by P (1,055 lb./acres) and NPK (988 lb/acre) treatments in the eastern series. In the western series NPK treatment recorded 1,163 lb./acre and cattle manure recorded 1,100 lb./acre.

After the cotton crop the field was prepared for raising ragi crop. Ragi (Co.1) was transplanted in June 1961.

The analysis of soil samples—depth 9 inches—8 inches from N.P.M. for moisture, loss on ignition, insoluble, iron alumina lime magnesium, total phosphate acid and total potash have been carried out. The results indicate that phosphorus uptake was higher in the plots receiving phosphorus fertiliser. Mechanical analysis was carried out of 0 inch—9 inches and 9 inches—18 inches depth soil samples. The results indicate that the soil is sandy loam.

Cumbu grain and straw samples from N.P.M. were analysed for their moisture total phosphoric acid and potash content. The results indicate that phosphorus uptake was higher in the phosphorus treated plots.

2. *Influence of manuring on the quality of grain.*—To study the influence of manuring on the quality of grain twenty ragi grain samples for the years 1959-60 from the differently manured plots of the New Permanent Manurial Experiments were analysed for

total and phytin phosphorus, nitrogen, calcium, potash and amino acids in proteinhydrolysate. Analysis of amino acids in protein hydrolysate were done by circular paper chromatography.

It was found that valine, leucine, isoleucine, tryptophane-tyrosine and lysine were found in all the matured plots. As the total protein increased, lysine content was found to decrease in (N plus P) treated crop. In the case of tyrosine also, it was found to decrease with increase in total protein in N plus P treated crop and NPK treated crop. It was seen that the addition of phosphorus to the soil as fertiliser, in general, increased the total phosphorus from 0.18 per cent to 0.31 per cent. Inorganic fertilisers have not only increased the total phosphoric acid but increased, the potash (0.84 to 1.75), lime (0.5 to 0.63) and protein (11.0 to 12.78). It has also increased the non-phytin phosphorus of the grains. It was seen that inorganic fertilisers improved the quality of grain than the organics.

C. General.

1. *Estimation of inorganic ions soil by paper chromatography.*—The object of the study is to investigate the reliability of chromatographic method in detecting and determining common ions within agricultural analysis. Calcium and nitrogen (inorganic in soil extracts were analysed qualitatively and quantitatively by this technique. Only qualitative analysis was satisfactory but the quantitative estimation was not satisfactory.

2. *Correlation of results of rapid soil testing methods with the traditional methods of analysis and crop yields.*—Soil samples collected at the Central Farm fields and other research stations were analysed at the Soil Testing Laboratory by the rapid soil testing methods for PH, electrical conductivity, available nitrogen and available phosphoric acid. The same soil samples were also analysed for the above said available nutrients and water soluble salts by the traditional analytical methods of soil analysis. This work has just started and so no definite conclusion has been drawn.

Observational trials were conducted in the fields of Central Farm to know how far the fertiliser recommendations given by the soil testing service are ideal. Five single plots observational trials (two in red soil and 3 in mid black soil area) were conducted during the summer season with two treatment, viz., (a) The Farm Schedule of fertiliser application and (b) schedule based on Soil Testing. The yield data showed that in 3 out of 5 trials where the recommendations based on Soil Test was 10 lb. N/acre less gave more yield than farm schedule. In the other two cases the yields of the farm schedule of fertilisation gave more yields. The need for replicated trials in field or pot culture was indicated.

3. *The Indian Central Oilseeds Committee—Scheme for research on storage of seeds and cakes of groundnut in Madras State.*—The three commercial varieties of groundnut kernels (i.e.) Coramandal, Peanut and Red Natal were taken up for storage studies during the period under report. The Groundnut Kernels were stored in plain 'B' Twill gunnies 'B' Twill gunnies lined with polythene and impregnated gunnies with the following treatments. (1) Control (2) Sprayer with insecticides, (3) Fumigation with Durogume, (4) Fumigation with fumito the total treatments being twelve only. The samples were analysed initially for moisture, total nitrogen, protein nitrogen, soluble nitrogen, oil content, free fatty acid, acid value and crude fibre. Subsequently 3 sets of samples were drawn at an interval of 2 months and analysis for the two sets of samples were completed. The third set of samples are now being analysed. The fourth and final set of samples will be taken in September and analysis will be carried out for the same. So far the result of analysis indicated that the durofume treated bags in all the three varieties have recorded lesser per cent of acidity when compared to other treatment. Analysis for the third set and final set of samples have to be observed before drawing the final conclusions.

As regards cakes three kinds of cakes (viz.) Expeller, Rotary and Chekku cakes were taken up for the study for the period under review. These were stored in similar types of containers with similar insecticide and fumigant treatment as mentioned for the kernel. Analysis for initial samples was completed. Subsequently 3 sets of samples were taken at intervals of 2 months period. Analysis for 2 sets of samples were completed and the analysis for the third set of sample was in progress. The result of analysis so far, indicated that expeller cake treated with durofume and fumitox records less acidity than the other treatments. The results of the same have to be confirmed on completion of the analysis for the third as well as final set of samples.

D. Soil Testing Service (Coimbatore).

Soil Testing and Recommendations.—(i) *Receipts*—There were 2,552 samples pending analysis at the beginning of the year. During the year 2,398 samples of soil and 133 of water were received for testing from cultivators from their fields as well as from the departmental officers, from State Farms and Research Stations.

(ii) *Analysis.*—Four thousand nine hundred and fifty samples of soils and 133 of waters were tested during the year. The soils were analysed for salinity, soil reaction and available nitrogen and phosphorus. The waters were tested for salinity and soil reaction.

(iii) *Recommendations*.—Recommendations for fertiliser use and use of soil amendments where needed were given for the soils tested from cultivators' fields and in the case of Research Station Samples the results were classified with respect of to nutrient levels and given. In the case of water samples recommendation on the suitability for irrigation was given.

Preparation of nutrient summaries.—Soil test summaries of the soils analysed were prepared every month classifying what percentage of soils tested came under low, medium and high with respect to nutrient status, etc.

The results show that.—

(i) *Reaction*.—Fifty-eight per cent of the soil tested from different parts of the State were showing pH above 8.0., (classified as moderately alkaline and alkaline) 37 per cent of soils showed pH. 6.0 to 8.0., classified as normal and 5 per cent below pH 6.0 classified as acid.

(ii) *Salinity*.—Eighty-five per cent of the soils tested were normal in respect of total soluble salt content, 11 per cent critical for growth and germination of salt sensitive crops and 4 per cent injurious to growth of crops.

(iii) Available nitrogen was low in 79 per cent, medium in 15 per cent and high in 5 per cent of soils tested.

(iv) Available phosphorus was low in 70 per cent of soils, medium in 22 per cent and high in 8 per cent of soils tested.

Extension and publicity.—Suitable charts and posters were put up in various exhibitions conducted in and out of the State to attract the attention of the visiting farmers to the free service rendered by the soil testing service.

Soil Testing Service (Aduthurai).

General.—The Soil Testing Laboratory, Aduthurai, was able to render good service to the farmers of the districts of Chingleput, North Arcot, South Arcot, Thanjavur, and Tiruchirappalli, during the year under report. Due to the operation of the Intensive Agricultural District Programme in the Thanjavur District, the soil testing work in this district, compared to the other district, was more wide spread. The receipts of soil samples were particularly heavy with the commencement of the cultivation season and the laboratory was called upon to bear some strain on account of this.

Soil Test Work.—The total number of soil samples received in this laboratory till end of June 1961 was 6,980. Out of this 2,402 samples were analysed and fertiliser recommendations made.

The number of samples received and recommendations made on the five districts served by this laboratory are as follows :—

(1)	Number of samples received. (2)	Number of recommendations given. (3)
1 Chingleput (including Madras City)	56	56
2 North Arcot	31	31
3 South Arcot	181	181
4 Thanjavur	6,484	1,121
5 Tiruchirappalli	228	13

Soil Test Advisory Work.—Of the problems facing the cultivators of the area, alkalinity, salinity and impeded drainage are the more important. Necessary advice regarding reclamatory measures and measures for preventing the deterioration of soil due to these conditions was given by this laboratory whenever such cases were brought to notice.

During the year, the Assistant Soil Chemist conducted two classes for the Agricultural Extension Officers, regarding soil testing, soil fertility problems and follow up work on soil test recommendations. Three leaflets were printed at the Government Press, Madras, pertaining to the following :—

- (1) Why soils should be tested.
- (2) Method of taking soil samples.
- (3) Reclamation of saline and alkaline lands.

These were distributed to interested farmers in connection with soil test work.

3. AGRICULTURAL ENTOMOLOGY.

I. Pests of Rice—(i) *The Rice Bug: (Leptocoris acuta TH)*.—A simple randomised replicated experiment for the control of this pest was conducted in the H block of the wet lands during the monsoon season of 1960 with the variety—Co. 19. The insecticides tried were dusts of (1) BHC 10 per cent, (2) D.D.T. 5 per cent, (3) Endrin 1 per cent and (4) Dieldrin 1.5 per cent and sprays of (1) BHC 0.1 per cent, (2) D.D.T. 0.1 per cent, (3) Endrin 0.02 per cent and an untreated control. The seedlings of the variety Co. 19 were transplants in 40 plots of size 16 feet by 15 feet and the insecticides were applied only once after the bugs appeared on the ears.

After the treatment there was reduction in the population of the bugs in all the treatments including the control. So the yield data and the infestation figures could not be correlated. The increased yield in the treated plots might be presumably also due to the stimulant action of the insecticides on the crop.

(ii) *Fixing up a schedule of treatments against the pests of paddy.*—A trial of the "split plot" design with three main treatments, viz., three rounds, four rounds and five rounds of application of insecticides and nine sub-plot treatments such as (1) BHC 10 per cent dust, (2) BHC 0.1 per cent spray, (3) DDT 5 per cent dust, (4) DDT 0.2 per cent spray, (5) Toxaphene 10 per cent dust, (6) Pyrodust 1,250—0.1 per cent spray, (7) Parathion 0.025 per cent spray, (8) Endrin 0.02 per cent spray and (9) control was carried out during the monsoon and summer seasons. These were replicated four times.

In both sets of trials it was noted that Endrin 0.02 per cent spray 5 times recorded the maximum yield of 7,090 and 5,649 lb. per acre respectively. It also effected the maximum reduction in the pest population. It was also noted from the data gathered that Endrin 0.02 per cent spray in all the three main plot treatments, viz., A, B and C gave the highest yield in both sets of experiments.

II. *Pests of Millets.—The Cholan Stem-borer.—Chilo zonellus Sw.*—This experiment was conducted to study the factors influencing the incidence of the cholam stem-borer. *Chilo zonellus Sw.* and to evolve a suitable method for its control. The first trial was conducted during July 1960 to January 1961 on Co. 11 cholam raised in F. No. 62 H, Central Farm. It was designed on a simple randomised and replicated pattern with four replications. The insecticides used were sprays of (1) Parathion (Folidol) 0.025 per cent, (2) Endrin 0.02 per cent, (3) Aldrin 0.1 per cent, (4) Dieldrin 0.1 per cent, (5) Basudin 0.1 per cent and (6) BHC 5 per cent dust. Two rounds of treatments were given during the growth phase of the crop, the first synchronising with the appearance of the pest and the other after an interval of three weeks. Initial infestation was recorded prior to the first round of treatment and further infestation counts at fortnightly intervals thereafter. At harvest, the yield data was also noted.

The data collected were analysed statistically and found to be not significant.

A similar trial was conducted during February 1961 to June, 1961 in F. No. 75 of the Central Farm. The chemicals used were the same except Basudin 0.1 per cent spray for which BHC 0.1 per cent spray was substituted. The crop was harvested on 21st June 1961 and the yield data were gathered for statistical analysis.

In the first set of trials Parathion spray recorded the maximum yield but the Endrin sprayed area showed the lowest incidence of the pest. In the second trial BHC 0.1 per cent spray gave the lowest average percentage of incidence. These observations did not tend to show any conclusive results. The experiment is being continued.

III. *Pests of Oilseeds—(i) The castor semilooper—Achoea janata L.*—Insecticidal trials could not be taken up against this pest for want of infestation during the period under report. Observations were in progress to note its incidence on alternate host plants and also its new parasites. The pest was noted on pomegranate and rose during September, October and November. *Microplitis ophiusae* (Ram) was the only natural enemy found parasitising the caterpillars.

(ii) *The castor shoot and pod borer—Dischocrocis punctiferalis Gr.*—Infestation of this pest was noticed on the ornamental castor plants around the coconut nursery in July and August 1960. Eighteen varieties of castor grown by the Oilseeds section were examined and it was found that EB-31 Brown recorded the lowest incidence of 30 per cent, whereas IRHO owedbeth and RI x Sengal showed the maximum infestation of 100 per cent. The infestation in TMV 1 variety was 53 per cent; owing to the failure of the crop in the field which was allotted for conducting the insecticidal trials against the pest, the experiment could not be carried out.

(iii) *The castor aleurodid.*—Severe infestation of the pest in the field was noted during October to January but during April to August the infestation was scarce. Life history studies revealed that the eggs took 4-5 days to hatch, the first and second instars lasted 3-5 days, the first instar usually travelled a few millimeters, the third instar produced a waxy fringe and the last instar turned yellowish. The entire life-history took about 19-20 days to complete. Crop failure in the allotted field prevented the taking up of any insecticidal control trials.

(iv) *The red-hairy caterpillar—Amsecta albistram M.*—Two field experiments were laid out in the Erode Division (Velampalayam and Kunnathur villages) using the dust formulations of BHC 10 per cent, Parathion 2 per cent, Toxaphene 10 per cent, Aldrin 2 per cent, Dieldrin 1.5 per cent and Endrin 1 per cent with appropriate control. The experiments were of the randomised replicated pattern, each plot measuring 32 feet by 18 feet gross with an inter-space of 3 feet in between. At Velampalayam the trial was taken up against grown up caterpillars. The treatments were given on 16th and 25th September, 1960, in the two places respectively after assessing the initial infestation. The mortality counts were taken 24, 48 and 72 hours after treatment.

All the chemicals were superior to BHC and were on a par. The trial conducted at Kunnathur revealed that in respect of mortality of caterpillars, Parathion was superior to the rest. It was followed by Toxaphene which was superior to Aldrin and Dieldrin and on a par with Endrin and BHC. The transformed

values of the mean percentages of dead caterpillars, under the different treatments were as follows. Parathion 35.99, Toxaphene 21.57. Endrin 18.87. BHC 18.73, Dieldrin 16.05 and Aldrin 14.56.

Further studies on the pests are in progress.

IV. *Pests of fruits.*—(i) *Fruit sucking moth—Othreis sp.*—As the pest concerned did not manifest itself at Chathrapati where the insecticidal trial against it, was to be conducted, the experiment could not be taken up during the period under report.

(ii) *Insecticidal trial against Helopeltis antonii (S) on guava.*—To evolve a suitable method of control of this pest, a replicated experiment was conducted in the College Orchard with 4 treatments, viz., DDT 0.2 per cent spray, Endrin 0.02 per cent spray, Malathion 0.1 per cent spray and control, replicated thrice. The chemicals were sprayed twice a month at fifteen days intervals and the percentage of infestation on the fruits under the different treatments were recorded. The data gathered reveal that all the three insecticides have recorded markedly low incidence compared to control. Of the three insecticides Malathion is the best as it prevents the secondary infestation by mealy bugs also.

V. *Pests of Cotton.*—(i) *The Cotton leaf roller—Sylepta derogata F.*—The cotton crop (P-216 F) in the rice fallows of the M block of Central Farm was kept under constant observation to note the incidence of the pest. The crop was free up to May but in June a light infestation was noticed in the outskirts. The proposed trial had to be abandoned due to the heavy rains that prevailed during the latter part of the month and due to the very low incidence of the pest.

(ii) *Fixing up a schedule of treatments against the pests of Cotton.*—Randomised replicated trial was conducted on MCU 1 Cotton in Field No. 2 of the Eastern block, new area during September 1961. The following insecticides, viz., sprays of Parathion (Folidol) 0.025 per cent, Endrin 0.02 per cent and product 1250-0.5 per cent were the treatments besides control. The number of applications given was three and four rounds in separate sets of plots commencing from the 4th week stage of the crop and repeated thereafter at monthly intervals in respect of three rounds plots and at tri-weekly intervals in the case of the other.

Parathion (Folidol) 0.025 per cent sprayed 4 times at tri-weekly intervals gave the best control of all the major pests of cotton and at the same time gave the maximum increase in yield of 704.6 lb. good kapas and 245.68 lb. of bad kapas compared to 411.69 lb. of good kapas and 180.62 lb. of bad kapas recorded in the control. Parathion 3 rounds and Endrin 3 rounds came next in efficacy. The statistical analysis of the data is yet to be done. Further trials will be taken up the next season.

VI. *Pests of tuber crops.*—(i) *The sweet potato weevil—Cylas formicarius F.*—The setts of the variety V8 were planted on 2nd January 1961 in Field No. 47 of Western block, Central Farm for a replicated experiment. The insecticides used were foliar sprays of (1) Endrin 0.02 per cent, (2) Parathion (Folidol) 0.025 per cent, (3) Dieldrin 0.1 per cent, (4) DDT 0.1 per cent, (5) Aldrin 0.1 per cent, (6) BHC 0.1 per cent and soil application of dusters of (1) DDT 5 per cent, (2) BHC 10 per cent, (3) Dieldrin 1.5 per cent, (4) Aldrin 2 per cent, (5) Endrin 1 per cent and untreated control. The above variants were replicated four times in a simple randomised manner. The chemicals were applied thrice at tri-weekly intervals commencing from the time of tuber formation. The results were assessed at the time of harvest by working out the percentage of infested tubers under the different treatments.

In respect of reduction in pest incidence, Endrin 1 per cent dust stood first followed by Dieldrin 0.1 per cent spray and Dieldrin 1.5 per cent dust. But with regard to yield Endrin 1 per cent dust came only 7th. Dieldrin 0.1 per cent second and Dieldrin 1.5 per cent dust fourth. Among the treatments, Aldrin 2 per cent dust had given the highest yield followed by Dieldrin 0.1 per cent spray and Endrin 0.02 per cent spray. But in respect of reduction in pest incidence Aldrin 2 per cent dust ranked fifth and Endrin 0.2 per cent spray ninth. Therefore, the increased yield in Endrin 0.02 per cent sprayed and Aldrin 2 per cent dusted plots might presumably be due to the stimulant action of the insecticides on the crop.

(ii) *The tapioca scale—Aonidomytilus albus (CKL).*—The purpose of the experiment is to evolve suitable control measures against the tapioca scale. Among the varieties of tapioca observed, the type 'Butter Stick' was found to be the most susceptible. A pilot trial purely on an observational basis was conducted during February-March, 1961 to evaluate the comparative efficacy of spray of (1) Parathion (Folidol) 0.025 per cent, (2) Malathion 0.1 per cent, (3) Pestox 0.15 per cent, (4) Systox 0.15 per cent and (5) a control. It was observed that the percentage of kill of scales under the different treatments were as follows: (1) Parathion 95 per cent, (2) Malathion 75 per cent, (3) Pestox 70 per cent, (4) Systox 96 per cent and (5) Control 2 per cent. It was seen that the vegetative growth of the setts infested by the scales was adversely affected. The experiment is to be repeated.

VII. *Pests of Stored products.*—(i) *Moisture content and insect infestation.*—An experiment was laid out in a randomised replicated fashion with 15 treatments (15 combinations with 3 degrees of dryings (no drying, 3 dryings and 6 dryings) 5 insecticidal treatments including control) and 3 replications. The variants were Aldrin, Dieldrin, Geigy 88 and Toxaphene. One lb. of

Co. 18 cholam seeds at three different moisture levels were taken in cloth bags and mixed with the above insecticides at 1:100 and the specific pest, *Sitophilus oryzae* was introduced in all the bags at the rate of 20 weevils per bag. The experiment is in progress.

(ii) *Storage trials with insecticide impregnated gunnies.*—A replicated trial with cholam Co. 19 was conducted from March, 1960 to November, 1960 to find out the usefulness of insecticide impregnated jute gunnies of Messrs. Infestation control corporation, Salem, in protecting the grains stored from pests. There were four impregnated bags and 4 untreated bags to serve as control. Equal quantities of cholam grains (80 lb.) were taken in each bag and they were initially fumigated as suggested by the Firm. Monthly counts of all the pests of stored products were taken from one lb. samples drawn at random from each bag.

During the first and second months of storage the grains in both the treated and untreated bags were free from infestation. From the third month onwards, the following stored product pests, *Corcyra cephalonica* H. *Sitophilus Oryzae* L and *Tribolium castaneum* M were noted to infest the grains stored in both the bags. Statistical analysis of the data showed that the impregnated gunnies had recorded markedly less number of *Corcyra cephalonica* H than the untreated ones. But as far as *Sitophilus oryzae* L was concerned, the impregnated gunnies had recorded significantly more number of insects than the control. Different in the count of *Tribolium castaneum* M in the two was not significant. From the above it could be deduced that the impregnated gunnies did not prove superior to untreated gunnies in warding off store pests.

VIII. *Soil Insecticides.*—Experiments to control the soil grubs in East Ramanad District could not be taken up owing to adverse weather conditions where cumbu and ragi were raised mostly under rainfed conditions. An initial survey was carried out in Bodinayakanur Block area to find out the villages affected by the chafer grubs which damage ragi crop to a considerable extent. Arrangements are being made to start a replicated experiment using soil insecticides like Aldrin, Dieldrin, Chlordane, Helptachlor, etc., to control this pest.

IX. *Biological Control.*—(i) *Bionomics of indigenous Coccinellids.*—With a view to study the potentialities of indigenous coccinellids in the field of biological control, the Coccinellids mentioned below were collected and attempts made to study their life history.

(a) *Chilomenes Sexmaculata* F.—These beetles were found feeding on *Aphis craccivora* K on *Gliricidia* and *Aphis gossypii* G on cotton bhendi. The life-history from egg to adult stage was found to occupy 18-21 days. The beetles were found feeding on aphids during favourable weather but not during hot summer months. Attempts to rear the beetles on a large scale did not prove successful.

(b) *Synonyma grandis* T.—(1) The adults of this beetle were found feeding on the bamboo aphid, *Oregama bambusae*. They are large, dark yellowish with black dots. They were also observed to feed on *Aphis gossypii* on cotton. *Brumus suturalis* beetles were found feeding on *Pulvinaria psiddi* on guava. *Thea cincta* F. the mycophagous coccinellid was found feeding on mildew ginglyly.

(ii) *Parasites and Predators.*—The mass rearing of the following parasites and predators was continued throughout the year. (i) *Periasierola nephantidis*, (2) *Trichospilus pupivora*, (3) *Trichogramma mintum* R. (4) *Aprostocetus* sp. and (5) *Cryptolimus montroussieri* Muls. The assistants posted for the Nephantis Parasite Breeding Centres at Coimbatore, Pattukottai and Udangudi were given the necessary training in the technique of parasite rearing at the College Insectary.

X. *Investigations on the insecticidal properties of some indigenous pisonous plants*—(a) *Sapindus emarginatus*.—A preliminary experiment was started on 30th May 1960 to try the efficiency of the exocarp of the fruits of the above plant as a granary insect repellent. Cholam seeds were mixed with the vegetable insecticide at the rate of $\frac{1}{2}$ oz. per one lb. of seeds and with Geigy 33 at 1 lb./100 lb. The seeds were examined once a month to note the progress of insect infestation. The control lot was found infested three months after storage while both the treated lots were completely free from damage even for a year. Based on the above findings a randomised replicated trial was planned. The seeds were first fumigated with EDCT at 20 lb. per 1000 cubic feet for 24 hours and mixed with the following variants after aeration. (1) *Sapindus emarginatus* $\frac{1}{2}$ oz./lb. (2) Geigy 33, (3) Aldrin 2.5 per cent dust at 1 oz./100 lb., (4) the fumigated seeds without any treatment and (5) control. The experiment was started on 10th January 1961. From the observations made during the five months it was found that all the lots except Aldrin treatment showed singessins of insect infestation even four months after storage. As the results obtained do not confirm the findings of the preliminary trial the experiment will be repeated again. The extract taken by soaking the soap-nut fruits overnight in water when sprayed against hairy caterpillars did not cause any mortality.

(b) *Seeds of Datura metal and Calotropis signates* powdered and dusted on granary insect pests did not cause any mortality.

(c) The extract of *Adhathoda* leaves when mixed with water and sprayed on aphids did not prove effective against aphids.

XI. *Adverse effects of insecticides.*—In order to study the adverse effects, if any, of the different insecticides the following chemicals, viz., sprays of (1) BHC, (2) DDT, (3) Lindane, (4) Aldrin, (5) Dieldrin, (6) Basudin, (7) HETP at 0.1 per cent level

and (8) Parathion (Folidol) and (9) Endrin at 0.05 per cent level were tested on Gingelly (Co. 1), Groundnut (TMV. 2) and castor (TMV-1) raised in pots. The above treatments were replicated four times and five plants were taken for each replication. A total of three rounds of treatments were given to the plants, the first round a month after sowing and at fortnightly intervals thereafter. The total number of leaves per treatment and replication were noted prior to the application and the number of leaves scorched was recorded on the third day after treatment.

In the case of groundnut gingelly and castor all the above insecticides caused very low and negligible per centage of leaf scorching. Secondary infestation by mites in gingelly and mealy bugs in groundnut was brought about by Endrin 0.05 per cent spray. In the case of castor, all the treated and control plants were observed to be heavily infested with aleurodids, a month after the third and final round of treatment.

XII. *Fundamental studies*.—The members of the teaching staff were attending to research problems pertaining to the pests of green manure crops, hairy caterpillars as crop pests, pests of cruciferous crops, pests of roses, pests of pulses and the bionomics of some important coccinellids apart from teaching.

XIII. *Economic aspects of earthworm*.—The question whether the presence of earthworms in the soil will improve the fertility was the basis for conducting the following experiment. Uniform type of soil in 20 pots were taken and they were divided into 4 sets, each set having 5 pots. One set was kept as control, i.e., without any earthworms and in the other three sets 5 earthworms in each of the third were introduced. At interval of every two months soil samples from these sets were taken and sent to the Agricultural Chemist for the analysis of Nitrogen, Phosphorous and Potash. Soil samples were sent on 16th January, 15th March and 21st May 1961. The results of analysis so far showed no difference in the NPK level of the soil with earthworms and without them. The experiment will be repeated.

XIV. *Mites as crop pests*.—A laboratory trial conducted on brinjal mite *Tetranychus tolaris* L. Using the variants, viz., Parathion (Folidol) 0.025 per cent, Aramite (1 oz. in a gallon of water) and Ultra sulphur (1 oz. in 3-1/8th gallon of water) as sprays and sulphur dust showed that all the insecticides were capable of effecting a cent per cent control in 48 hours. A maximum kill in 24 hours was observed in the case of Ultra sulphur. Observations on the incidence of mites on castor (*Euteranychus banketti*), cholam (*Oligonychus indicus* H), Sweet Potato, Bhendi and Brinjal, were continued.

XV. *Bee-keeping*.—An average strength of HO Bee-colonies was maintained for experimental purposes at the Apiary during the period under report. The Progress of the Colonies mainly depended

upon the Pasturage, and weather condition. The beginning of the year was unfavourable, owing to winds and rains. Eventhough some quantities of Pollen and nectar were available from Acacia, coconut, drumstick, banana and Garden flowers during this part of the year, bees could not accomplish their foraging trips and augment their food supply on account of the inclement weather. The proper season for the bees commenced from the month of November as usual and conditions of weather and pasturage were congenial till March. Brood rearing was satisfactory and the instinct for swarming was pronounced during this period. The drought after March caused difficulty in collecting nectar. The early setting in of the south-west monsoon by the middle of May resulted in weakening of the colonies.

A total quantity of 134 lb. 7 oz. of honey was extracted during the course of the year and the maximum obtained from a colony was 11 lb. 6 oz. The month of December was favourable for the bees and the maximum quantity of 37 lb. of honey was extracted. Comb foundation sheets to the extent of 27 lb. were manufactured and supplied to parties who indented for them. Under selective breeding, both cross-breeding and line-breeding were adopted. Colonies headed by line-bred queens were better yielders than the colonies headed by cross-bred queens. But both of them were found to be superior to bulk colonies. Work on swarm prevention and studies on different types of hives were also in progress. The 10 framed Newton type of hive was observed to be better suited than the 7 framed hive.

Training and Propaganda.—Wherever there were opportunities, exhibits pertaining to bee-keeping were put up with a view to make the public acquainted with the latest methods of bee-keeping. Help and advice were given to interested persons in practical bee-keeping. Agricultural exhibits put up at the first National Agricultural Fair, Calcutta, at the Congress Exhibition, Teynampet and in the exhibition arranged in connection with the College Day and Conference, Agricultural College and Research Institute, attracted a large number of people. Practical training, in bee-keeping was given to the II year B.Sc. (Ag.) students the final year students undergoing practical training in Agriculture, students of the Faculty of Entomology, trainees of Gardeners and Young Farmers' course and three batches of Extension Officers undergoing refresher course in Agriculture.

XVI. *Systematics*.—The work on the reclassification and re-arrangement of the insect collection was continued. About 100 species belonging to the family Noctuidae (Lepidoptera) and a few species under the family Curculionidae (Coleoptera) were rearranged. The specimens found in the mixed collections with reference to the family Nectuidae were identified and incorporated with the named collection.

XVII. *Review of work done under Schemes*—(i) *Scheme for study on Field Rats: (Indian Council of Agricultural Research).*—Work was carried out under the following six items, viz., (1) maintenance of records of temperature and humidity, (2) studies on the population of rats, (3) identification of rats and their ectoparasites, (4) damage done by rats to individual major crops, (5) records of conditions of soil, burrows and burrow patterns and (6) the food habits of rats. Six species of rats were collected and studied.

(ii) *Scheme for research on the Toxicology and Adverse effects of Synthetic pesticides I.C.A.R.*—Experiments conducted with systemic chemicals like demeton (Systox), methyl demeton (Metasystex), Shardan (Pestox 3 H) and thiomethon and thiometon (Ekatin) for the control of cotton boll worms, cotton stem well, cholam stem-borer, paddy stem borer, the cotton merely bug and the vein clearing disease of phondi showed that the above insecticides were ineffective.

(iii) *Vegetable scheme.*—(Entomological investigations I.C.A.R.).—The work has been in progress as per the technical programme.

Observations on the binomics and seasonal incidence of the epilachna beetle of brinjal showed that it was more abundant during the monsoon season crop than during summer. The orinjal mite, *Tetranychus telarius*. L was noted all through the year attacking the leaves on the under-surface and making the leaves turn yellow. It has been noted on other plants like bhendi and cotton.

The bhendi jassid, *Empoasca devastans* D was present all through the year but density of population was more in summer than in the monsoon period. It was observed on brinjal and bitter gourd.

The curcubit fruit fly *Dacus Cucurbitae* Cog. appears to prefer bitter gourd when they are maturing to the tender ones. Although it attacks snake gourd also, the attack is more severe on bitter gourd.

Insecticidal control of the brinjal epilachna, mite and bud-worm was attempted in two randomised replicated experiments conducted on the monsoon and summer crops during the year. The first trial did not show much difference among the insecticides tested. In the second experiment however, Endrin, Parathion and DDT had effectively reduced the Epilachna beetle and had increased the yield of fruits also. Mites were controlled by, Parathion (Folidol) 0.025 per cent spray.

For the control of the Bhendi jassid also two experiments in randomised replicated pattern were taken up on the monsoon

and summer crops. Endrin 0.02 per cent and DDT 0.1 per cent showed good reduction of the jassid population and increased the yield also as compared to control.

In the case of the bitter gourd fruit fly, an experiment was conducted in the randomised replicated pattern using DDT 0.01 per cent, Endrin 0.02 per cent and Ekato 0.1 per cent. Parathion (Folidol) 0.25 per cent and control as the variants. Endrin 0.02 per cent recorded the least incidence of fruit flies and highest yield.

A similar experiment for the control of the tomato fruit-borers with Endrin, 0.02 per cent, DDT 0.1 per cent, Malathion 0.1 per cent and Calcium arsenate 1 ounce plus 1 ounce lime in 1 gallon of water, conducted in the monsoon season did not give conclusive results as the incidence of the pest was low.

(iv) *Scheme for research on the Rice Stem-borer, Aduthurai, Thannjavur district (Financed by the Indian Council of Agricultural Research).*—The experiments under the scheme were carried out in the 3 seasons, viz., Kuruvai, Samba and Thaladi, at the Agricultural Research Station, Aduthurai. Five major items of work enumerated below were under investigation.

1. (a) Study of varietal susceptibility to the attack by the stem-borer.

(b) Study of varietal susceptibility of certain popular varieties to the attack by the stem-borer at different centres of the State.

2. Studies on the time of sowing and the incidence of attack by the stem-borer.

3. *Control measures by.*—(a) Mechanical removal of egg masses.

(b) Raising of trap crop of paddy in the nursery.

(c) Spraying of the crop with parathion and Endrin.

4. Studies to find out the exact number of broods in a year and

5. Breeding fish in paddy fields to control stem-borer.

As far as varietal susceptibility to the attack by stem-borer was concerned, it was observed that there was no direct correlation between the percentage of incidence and yield. In the case of "early sown" and "late sown" crop, early sown plots recorded higher yield with lesser infestation than the late sown plots. Popular variety TKM 6 was found to be fairly resistant to the pest. Control of the pest by insecticidal means was also attempted.

(v) *Sugarcane Insect Pests Scheme, Coimbatore* (Financed by the Indian Central Sugarcane Committee).—Research work was carried out as per the approved technical programme. 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 to enable the forecasting of pest incidence.

The fundamental studies on borers were continued on the 1960-61 crop.

Of the three varieties under study, the variety Co. 421 recorded the maximum incidence of 19.1 per cent by *Chilo tritaenella* S. while the other two varieties Co. 413 and Co. 419 recorded 17.8 per cent infestation respectively.

The maximum incidence by *Proceras indicus* K was 26.7 per cent 41.8 per cent and 35.7 per cent in the three varieties Co. 413, Co. 419 and Co. 421 respectively.

Insecticidal control trials against the early-shot borer, *chilo tritaenella* S, indicated that the application of the insecticides in the soil did not give any reduction in the population of the borer. In the case of internode borer *Proceras indicus* K it was noted that Endrin 0.05 per cent spray was more effective in controlling the borer than others. Application of Heptachlor in the furrows, proved to be effective in warding off the termites. Parathion 0.05 per cent spray gave the maximum kill of the white fly of sugarcane and also prevented the secondary infestation by aphids. A detailed survey of the different districts was undertaken to record the percentage of incidence of the various pests of sugarcane during the period under report. The scheme was shifted to Cuddalore with effect from 1st April 1961.

(vi) *Miscellaneous.*—(a) *Fumigations.*—Consignments of seed material intended for storage by various specialists were fumigated and rendered pest free.

(b) *Phytosanitary Certificates.*—A total of 39 consignments of seeds and other planting material intended for despatch to foreign countries were fumigated and necessary certificates issued.

(vii) *Steps taken for the dissemination of results of research and the economic benefit to the ryots.*—All the findings of research which are useful and economically important 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) *Paddy Blast—Pyricularia oryzae.*—Seventy-four cultures of paddy comprising of 25 long, 31 medium and 18 short duration were tested for their relative resistance to blast disease. Since the incidence of the disease was negligible in all the cultures including the controls Co. 13 and A.D.T. 10, the relative resistance of the cultures to blast infection could not be assessed.

Fungicidal trial against paddy blast on two susceptible varieties viz., Co. 13, and A.D.T. 10; was laid out with 12 proprietary fungicides. As the incidence of the disease was very low, the efficacy of the fungicides in controlling blast disease could not be assessed. However most of the fungicide treated series have recorded increased yield ranging from 4 to 35 per cent over control but the treatment differences are not statistically significant.

Out of the 226 short duration types tested for their relative resistance to blast disease by artificial spray inoculation in the seedling stage 127 were found to be susceptible, 74 hypersensitive and 25 resistant.

(2) *Helminthosporiose of paddy (Helminthosporium oryzae).*—The efficacy of twelve proprietary fungicides, viz., Bordeaux mixture, Fytolan, Dithane Z. 78, Flit 406, Sulphur dust, Ceresan lime mixture, Forbam, Agrosan dusting powder, Ziram, Microses Colloidal copper and Parry cop were tested in randomized and replicated plots for the control of Helminthosporiose of Paddy at the Rice Research Station, Tirurkuppam. The variety ASD. 5 was used in the experiment. Two rounds of spray and dust treatments were given to the crop. Observations recorded on the incidence of the disease have shown the presence of only mild infection. However the treated series have recorded increased grain yield over control with Bordeaux mixture series recording the highest increase of 25 per cent over control closely followed by sulphur with 20 per cent increase. The treatment differences were not statistically significant.

(3) *Ragi blast—Pyricularia sp.*—With a view to find out the efficacy of fungicides in controlling Ragi blast, a fungicidal experiment was laid out in July, 1960 on Co. 5 Ragi. Two sprayings were given with 9 fungicides including 1 per cent Bordeaux mixture. Though the disease incidence was very low during the season it was found that plots sprayed with Dithane. Z. 78 have given the highest yield of 36.5 per cent over control closely followed by Bordeaux mixture and Fytolan with 34.4 per cent and 30.4 per cent over control respectively. The yield data were not statistically significant.

During May 1961 another fungicidal trial was laid out with 15 fungicides on Co. 7 Ragi crop. Counts on neck infection were

recorded and analysed. It was found that all the treated series except Agrosan dust were superior to control. The treatments Bordeaux mixture 1 per cent, Bordeaux mixture $\frac{1}{2}$ per cent, Mictocop, Wettable sulphur, Dithane Z. 78, Colloidal copper, Ziram, Sulphur and Parry cop were on a par and were significantly superior to control in respect of neck infection. The yield data revealed that all the treated series recorded increased yield over control and the treatment, viz., Coresan lime dust, Dithane Z. 78, Flit 406 and Bordeaux mixture 1 per cent were found significantly superior to control in respect of yield.

(4) *Sorghum leaf diseases*.—A survey was made in and around Dindigul, viz., 1. Erode, 2. Old Oddancharam, 3. Athikomba, 4. Thummachampatti, 5. Nandavanapatti, 6. Gurukkal Iyanpatti, 7. Vedasandur, 8. Nilakkottai, 9. Nakkaluthur, 10. Ranganathapuram and 11. Mettuppatti. *Cercospora* leaf spot was found prevalent only in the first five localities but the incidence of *Belminthosporium turcicum* was observed in all the places.

Six isolates of *Helminthosporium turcicum* were brought into pure culture by single spore isolation method.

(5) *Anthraxnose of Leguminosae*.—Temperature and pH requirements of different species of *Colletorichum* isolated from leguminous plants were studied. Anthracnose disease on *Dolichos lab-lab* was found to be both internally and externally seed-borne. Seed treatment with Dow 9-B recorded considerable increase in germination. As a prophylactic, Dithane Z. 78 (15 per cent) was found to be most effective followed by Griseofulvin (0.1 per cent) in the control of anthracnose disease of *D. lab-lab*. Hot water treatment at 65 degree centigrade for 30 minutes was found to be effective for the control of seed borne infection.

(6) *Virus disease of legumes*.—Observations on the incidence of virus diseases on the pulse crops were made at the Milled Breeding Station, Coimbatore, during the summer season 1961.

Two readgram varieties viz., S.A. 1 and 1.141 have shown the incidence of sterility mosaic disease.

Greengram Co. 1 variety showed the symptoms of yellow mosaic virus.

Mosaic virus.—Six varieties of *Dolichos lab lab* were tested, for their relative susceptibility to virus infection under pot culture conditions. The sap transmissibility of the bean mosaic virus was also tried and it was found that the virus is sap transmissible. Among the 6 varieties tested, viz., DL. 211; DL. 453; DL. 269; DL. 289; DL. 389; DL. 692; variety DL. 244 was found to be more susceptible than other varieties by sap transmission, under pot culture condition.

(7) *Brown Rot of Potato (Pseudomonas Solanacearum)*.—During the main season (April) of 1960, a randomised replicated trial was conducted by treating the tubers prior to planting in solution of Mercuric chloride, formalin, wet ceresan, 1 per cent Bordeaux mixture, Cerenox, Phytomycin and Mercuriline with suitable controls. As regards wilting it was observed that the treatments formalin, Phytomycin and control behaved alike and the number of wilted plants was found to be least, in mercurine treated plots. The yield data gave statistically significant results. Treatments formalin, mercurine, bordeaux mixture and phytomycin were found to be superior to other treatments.

When the experiment was repeated in Autumn (September 1960) in addition to tuber treatment, the soil was also drenched with the above chemicals two months after planting. This led to crinkling and wilting of the plants in the treated plots resulting in reducing yield than control. Therefore it was evident that applications of these chemicals to soil was injurious to potato crop. The experiment was again repeated in February 1961 with Aretan and Hexasan in addition to the above chemicals. It was found that the percentage of infection of tubers was less in Aretan, Hexasan, yield data and infection percentage were not however found to be statistically significant.

(8) *Black arm of cotton-Zanthomonas malvacearum*.—A field experiment against Black arm of cotton caused by *Kanthomonas malvacearum* was conducted with a view to find out the relative efficacy of different antibiotics and fungicides at Agricultural Research Station, Bhavanisagar and at Central Farm, Coimbatore. Although the incidence of the disease was low in both the places it was observed that all the treated series gave increased yield over untreated control. At Bhavanisagar the highest yield was obtained from plots treated with 1 per cent Bordeaux mixture Ziram, Microp, and Ferbam when compared to other treatments. At Coimbatore plots treated with Dithane D-14, Bordeaux mixture 1 per cent Miorocop; Agritrep and Phytomycin have given more than 30 per cent increased yield over control.

Besides, imperfect boll opening was also very much less in all treated plots.

(9) *Studies on Pythiaceae gunji*.—Pathogenicity tests were conducted with 20 isolates of *Pythium aphanidermatum* on ten day old seedlings as well as pre-emergence damping off of *Lucopersicon esculentum* under pot culture conditions. From the observations recorded it was found that only one isolate of *P. aphanidermatum* was non-pathogenic on *L. esculentum*. Three isolates namely 3, 15 and 20 were found to be highly pathogenic whereas the rest of the isolates were infective to varying degrees.

Control of 'Damping off' of Vegetable seedlings (*P. aphanidermatum*) by seed treatment and drenching trials with various fungicides and anti-biotics :—To test the efficacy of different fungicides and antibiotics as seed treatments, six fungicides namely, ceresan dry (1/45), ESD/A.M. (1/450) ESD/PIS. 1/450.) Cerenox (11450) ; Cerenox (3/450); Phytomycin (100 PPM); Aretan (1 pound in 20 gallon) were used against damping off of bhendi caused by *P. aphanidermatum*. The data were analysed statistically and the treatment differences were not found to be significant. However, Cerenox (3 gms/450 gms) treated series recorded the maximum germination closely followed by ceresan and ESD/AM.

In drenching trials against pre-emergence damping off of bhendi the following fungicides were used, viz. :—

- (1) Aballol 1 percent.
- (2) Bordeaux Mixture 1 per cent.
- (3) Microcop 1 pound in 40 gallons.
- (4) Cuprous oxide 1 pound in 40 gallon.
- (5) Cupravit oxide 1 pound in 40 gallons.
- (6) Cheshunt compound 1 ounce in 2 gallons.
- (7) Wet cereson 1 pound in 100 gallons.
- (8) Leytosel 1 pound in 100 gallons.
- (9) Flit 406 1 pound in 40 gallons.
- (10) Dithane Z. 78. 1½ pounds in 100 gallons.
- (11) Ziram 1½ pounds in 100 gallons.

The data were analysed statistically and found not significant. However the fungicide Ziram recorded the highest per-centage of germination.

Physiologic strains in *P. aphanidermatum*.—With a view to find out the existence of physiologic races in *P. aphanidermatum* twenty isolates of *P. aphanidermatum* were inoculated in 3 hosts, viz., *Hi-biscus esculantus*, *Solanum melongena*, and *Lycopersicon esculentum* to test pre-emergence pathogenicity and on the 10 day old seedlings to test post emergence pathogenicity.

The studies revealed that there existed wide variation in pathogenicity between isolates on the 3 crops mentioned above. The extent of pathogenicity was found to vary from 0-100 per cent. The degree of pathogenicity of the same isolate also varied from crop to crop. These studies indicated that *P. aphanidermatum* existed in nature as physiologic races.

(10) **Banana anthracnose—Physiological studies.**—The studies on the effect of nitrogen on growth and sporulation of 12 isolates of *Gloeosporium musarum* revealed that pepotone and asparagin

supported good growth and sporulation and Ammonium sulphate recorded minimum sporulation of all isolates compared to urea, potassium nitrate and sodium nitrate.

As regards carbon selectivity of the isolates for growth and sporulation, glucose and sucrose in general supported good growth and sporulation of the isolates, whereas Xylose and mannitol recorded poor growth and sporulation.

Studies on temperature relation showed that a temperature of 30° C is the most favoured by all isolates of *G. musarum*. All the isolates tested showed least growth at 15° and 37° C. There was no growth at 10° and 40° C.

As regards their reaction towards various H-ion concentration, the maximum growth of all the isolates was found to be at pH 5.5. But the PH. for maximum sporulation varied with different isolates.

(11) **Coconut wilt.**—The wilt disease of Coconut caused by *Ganoderma lucidum* was observed to be prevalent in some places in the North Arcot, Thanjavur, Kanyakumari and Ramanathapuram districts. The specimens of diseased root and stem from different places have been collected and isolation of the casual agents responsible for the disease and pathogenicity studies are in progress.

(12) **Seed borne fungi of cereals.**—In order to study and survey the seed borne microflora of paddy seeds, 8 economically important paddy varieties collected from various research stations of Madras State were utilised. The seeds were incubated in oats agar medium for the isolation of seed borne microflora. The following fungi, viz., *Penicillium*, *Aspergillus*, *Rhizopus*, *Curvularia*, *Helminthosporium* and *Fusarium* a bacterium were isolated from the seed samples. The effect of *Aspergillus*, *Fusarium* and *Curvularia* was studied on seed germination and seedling vigour both in germination trays and in pots. It was found that in the case of all varieties inoculated with the above fungi there was a reduction in germination percentage compared to that of untreated control. The seedling vigour was also found to be reduced in fungus treated series compared to that of uninoculated series.

(13) **Bacteriology—1. Survey of microflora of the soils of Madras State.**—The microbiological analysis of 74 soil samples representing the districts of Coimbatore, Madurai and Salem was carried out. The analysis revealed that the average total content of micro organisms in the arable layer of soils in 10, 7.8 and 5 lakhs per gram of dry soil for the Coimbatore, Madurai and Salem district respectively. Bacteria predominate in the soils and represent 88-95 per cent of the total population, actinomycetes 8-11 per cent and fungi 1-2 per cent. *Azotobacter* was absent in 22 out of the 74 soils analysed.

2. *Factors affecting nodule development and nitrogen fixation by legumes.*—The effect of application of different levels of available nitrogen on nitrogen fixation by redgram is being studied.

3. *Scheme for supply of bacterial cultures to community Development Blocks.*—Bacterial inoculation for treating green manure seeds for sowing in about 300 acres was supplied.

Indian Council of Agricultural Research Schemes.

1. *Scheme for the investigation of stem-rot of rice-study of varietal resistance.*—Forty two varieties were tested for their relative resistance to stem-rot disease. Only seven varieties recorded infection above 10 per cent. The control Advt. 3, and 21 varieties recorded infection below 10 per cent.

Effect of Manures.—A field experiment conducted with 27 combinations of N, P and K in graded doses revealed that increased nitrogen tended to increase the disease incidence while K had a suppressing action.

Effect of soil fungicides.—Wet cerasan applied at monthly intervals proved most effective in the control of the disease among the fungicides tested.

2. *Investigation of betelvine wilt in Madras State.*—Among the fungicides tested Bordeaux mixture appeared to be more promising than others and the yield has also been significantly higher in the Bordeaux mixture treated plots. The plots receiving farm yard manure have recorded significantly higher percentage of wilt than all the other treatments. Both the local varieties of betelvine, viz., Pachaikodi and Karupurakodi were found equally susceptible to the disease.

3. *Scheme for the investigation of Fusariose wilt of solanaceous vegetables.*—The survey of vegetable growing areas in the districts of Coimbatore, South Arcot, North Arcot, Thanjavur, Chingleput and Tiruchirappalli was made and the incidence of wilt disease in these parts was assessed in brinjal, chilli and tomato. The incidence was found to range from 0.20 per cent. Heavy incidence was recorded in Mayuram Division. Twenty-six isolates of *Fusarium* sp. (16 from brinjal, 6 from tomato and 4 from chillies) have been obtained for further study. Morphological and cultural characters of these isolates were studied. The isolates were tentatively identified as *Fusarium solani* and *Fusarium Oxysporum*. Cross inoculation studies have revealed that the isolates tested so far are cross inoculable and not host specific.

4. *Scheme for the study of nitrogen fixing blue green algae in rice soils of Madras State.*—*Tolypothrix tenuis* exhibited maximum growth in Watanabe's medium at pH 9 than at pH 7 or 8. Watanabe's medium was found superior to Bristol's and Chu's

at pH 8.5 in promoting good growth of *T. Tenuis* as well as in the production of greater amounts of extra cellular nitrogen. Growth of *T. Tenuis* increased with the increase in the quantity of the medium. *T. Tenuis* exhibited better growth under continuously illuminated conditions and under aeration. *T. Tenuis* when added to rice soil under pot culture conditions increased the grain and straw yields. Seventy-eight collections of the blue green algae were made from fifteen different places situated in the major rice growing tracts of Madras State. Among these algae collections from Aduthurai, Bhavanisagar, Coimbatore and Tirukuppam 63 species belonging to 24 genera distributed over six families were identified. The occurrence of two species from India are reported for the first time.

5. *Scheme for the Investigation of Banana diseases in Madras State.*—Survey of important banana growing areas in Coimbatore, Madurai, Salem, Thanjavur, Tiruchirappalli and Tirunelveli districts was taken up. Banana wilt, fruit rot and leafspot diseases were observed in 36, 10 and 29 per cent of the gardens visited respectively. The variety Mothan was found to be susceptible for all the above banana diseases.

Twenty-two isolates of *Fusarium*, six of *Gloeosporium musarum* and one *Deightonella torulosum* were isolated and brought into pure culture.

Ten isolates of *Fusarium* were under pot cultural experiments for testing the pathogenicity. The variety Rasthali was selected for conducting the above experiments. An isolate from Coimbatore (C1) was found to cause wilt in 40 days after inoculation.

In order to test the varietal resistance for wilt and anthracnose, forty-three varieties of banana, including ten wild types have been planted in central farm wet lands, Poovan, Montham and Rasthali varieties have been raised each in an area of about 0.25 acre for conducting fungicidal trials for the control of leaf spot diseases, Panama wilt and fruit rot. For conducting pathogenicity tests under field conditions for all the *Fusarium* isolates the variety Rasthali has been raised in an area of about 0.25 acre.

6. *Scheme for Research on Fungicides.*—(1) Spray trials were conducted to test the efficiency of the different fungicides in the control of the following diseases :—

- (a) Paddy blast (*Piricularia oryzae*).
- (b) Anthracnose of chillies (*Collectotrichum cansici*).
- (c) Tikka disease of groundnut (*Cercospora personata*).
- (d) Damping off tobacco (*Pythium* sp and *Rhizoctonia* sp) (Drenching trial).

(2) Seed treatment trials were conducted to test the efficacy of the different fungicides in the control of the following diseases :—

- (a) Leaf spot paddy (*Helminthosporium oryzae*).
- (b) Angular leaf spot of cotton (*Xanthomonas malvacearum*).
- (c) Damping off of tobacco (*Phythium sp* and *Rhizoctonia sp*).

In the case of the angular leaf spot of cotton the plots treated with cerasan and 2 per cent cerasan recorded very low incidence of disease and they were found to be significantly superior to the other treatments and control. The differences in germination between treatments were not statistically significant although 2 per cent cerasan, Dow 94 and Agrosan G. N. series have recorded higher germination over control. In the case of the damping off of tobacco the plots treated with cerasan, Flit 406, Agrosan G.N. and Arasan gave significantly increased germination over the treatments and control. Regarding anthracnose of Chillies the observations revealed that the plots treated with Bordeaux mixture, Fungimar, copper sandoz and Cupramar were found to be significantly superior to the other treatments and control in respect of controlling the disease. In the case of Tikka leaf spot on Groundnut the infection counts recorded revealed that there was less incidence of disease in the plots treated with Fungimar; Bordeaux mixture and Cupramar. In other cases the data obtained were not statistically significant.

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 Cholan.
- (b) Aduthurai—Paddy (Kuruva and Samba).
- (c) Kovilpatti—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 and Reviewing-Committee, constituted by

the Government of Madras, for conducting artificial rain-making experiments. The experiments were conducted at the Agricultural College and Research Institute, Coimbatore, as per programme, during the period under report.

(iv) Statistical analysis.—(a) The data on dew formation collected from 10—12—1958 to 11—3—1959 and 6—12—1959 to 22—3—1960 at the Agricultural College and Research Institute, Coimbatore, were studied in relation to maximum-minimum and grass-minimum temperatures, relative humidity and vapour pressure and wind-velocity. The study revealed that a fall in the reading of the grass-minimum thermometer by 3° F and above in December and January causes appreciable dew formation. Only the morning relative humidity exercised significant influence on dew formation right throughout the period. If data are collected for at least two decades, it may be possible to forecast the nature of dew formation from the readings recorded with the grass-minimum thermometer.

(b) The data on the performance of Swarnawari, samba, and Navarai paddy crops, raised at the Agricultural Research Station, Tirukuppam, for the period 1942-43 to 1959-60 were compiled and the influence of rainfall, rainy days, temperature and relative humidity, prevailing during the different growth-phases, on the final yields of crops were studied. The study revealed that the prolongation of maturity period adversely affects the yields of Navarai and Swarnawari crops. Rainfall during the fourth, sixth and ninth weeks after planting depresses, respectively, the yields of Swarnawari, Samba and Navarai crops. For forecasting the yields of crops, data are to be collected systematically for many years.

(c) The influence of maximum temperature, mean air temperature, average relative humidity, number or hours of bright sunshine, total rain-fall and number of rainy days on the noon-soil-temperature at 3 inches, 6 inches and 12 inches depths at the Agricultural Meteorological Observatory, Coimbatore was studied. The study revealed that the soil-temperature at 12 inches depth is rather steady, while the fluctuations are more at 3 inches depth. The annual mean-maximum-temperature influences considerably the noon-soil-temperature at 12 inches depth. The soil-temperature at noon at 3 inches and 12 inches depths is affected by rainfall only during the South-West Monsoon period and the number of rainy days affects the soil-temperature in all months, except January and February.

(d) The influence of mean-air-temperature and minimum temperature prevailing during the several weeks before the flowering on the yield of paddy Co. 25, raised at Coimbatore, was studied statistically. The study indicated that the minimum

temperature prevailing during the third, fourth and fifth weeks before flowering has a positive significant influence on the yield. Taking also into the effect the positive significant effect of the rainfall received during the second and third weeks before flowering a multiple regression equation was worked out to forecast the yield of paddy Co. 25, at Coimbatore, with a fair degree of success.

(e) The daily rainfall data recorded at nine rain-recording stations near the Agricultural College and Research Institute, Coimbatore, were compiled.

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

(g) The variations of soil-moisture at different depths at weekly intervals in the observatory and amidst cholam and cotton crops during 1960-61 were studied and the results were presented at a weekly seminar of the Agronomy Faculty of the Agricultural College and Research Institute, Coimbatore.

(h) The meteorological data, pertaining to the Agricultural Research Station, Palur, for the period 1941 to 1954 were compiled.

(i) The daily rainfall data recorded at Coonoor, Ootacamund and Nanjanad were compiled.

(j) The data on the duration of dry and wet spells for the different seasons that prevailed for 53 years from 1908 to 1960 at the Agricultural College and Research Institute, Coimbatore, were compiled.

(k) The data on monthly rainfall and number of rainy days pertaining to the different districts of the Madras State from the year 1870 onwards are being compiled.

(l) The rainfall data received from the District Collectors were compiled.

(v) *Studies in collaboration with the Government Entomologist and the 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. This is a long range experiment, requiring collection of data for at least two decades.

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

(vi) *Study of crop climate—Relationship in cholam.*—Detailed observations regarding height, number of tillers, leaves and 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.

Supply of weather data.—Weather data and advice were given to the Officers of both the State and Central Governments and also to Quasi-Government Bodies.

Weather returns.—(i) The daily comparative weather statement was maintained throughout the period under report and the consolidated monthly statements were submitted to the Director of Agriculture Meteorology, Poona.

(ii) Particulars regarding the influence of weather conditions on the cultivated crops in the Madras State were collected from the District Agricultural Officers, Plant Protection Officers and Officers in charge of the Agricultural Research Stations and the consolidated report on the season and its effects on crops in the Madras State was prepared and submitted to the Director of Agriculture, Madras.

Folk lore.—The Agricultural Meteorologist collected folk lore by contacting ryots during his tours to the crop weather stations.

6. BOTANY.

1. *Plant introduction and acclimatisation trials.*—During the period 280 species of seeds and planting materials were obtained both from abroad and other parts of our country for introduction and acclimatisation and the same were distributed to the Fodder Research Officer, various crop specialists, Curator, Botanic Garden, Ooty and other officers of this department for trial. *Sesbania kirkii* appears to be promising as quick growing and early maturing green manure plant; *Tephrosia noctiflora* is another potential green manure plant with vigorous, good growth and profuse seeding and is likely to do better than *T. purpurea*, the wild indigo. *Chichorium intybus* form Belgium was found to be successful at Coonoor with good seed setting. Sanders upright (a variety of cowpea), *Cenchrus ciliatus* (Koloniosplat), velvet bean No. 7, velvet bean No. 8 and velvet bean No. 8 were found to be promising in the Fodder Research Scheme, Coimbatore.

2. *Exploitation of Indigenous plant wealth.*—The total number of plant collections made during the period exceed 60 species and includes members of varying economic significance. Notable among them are few rhizomes of minor food value, some ornamental such as *Notonias*, *Eupherbias*, *Gloriese*, *Superba*, *Coralluma*, *Attenuata*, *Bousserosia umbellata* a few ferns,

Psoralea corylifolia, *Soilla indica* and *cymbopogon* species. A wild species of *banula* which may be useful for essential-oils was also collected and is being established. A perennial wild cowpea relative, *Viga Wightii* has been well established and is under study.

The localities of collection were confined to the hilly ranges of Tiruchirappalli district, Singampatti, Virudhunagar, Tuticorin and Cape Comorin. The materials were grown in pots under Coimbatore conditions and were under observation.

3. Minor crops.—Studies on minor crops, unbelliferous plants and *Trigonella*.—The study commenced with the observational trials of 107 species of *Cariandrum Sativum*; 100 species of *Foeniculum vulgare*, 95 types of *cuminum cyminum* and 14 types of *Trigonella foenum-graecum*. All the types of *coriandrum sativum* raised under rainfed and irrigated conditions showed wide variations in duration habit and yield performances. Promising types are fixed up for further trial and selection. All the types of *Foeniculum vulgare* were studied for their adaptability and desirable attributes, besides studying their floral biology and pollination. All the types grew well and single plants have been selected for further trial and selection. Ninety-five types of *cuminum cyminum* sown during cold season did not germinate under Coimbatore conditions. In *Trigonella foenum graecum*, two types were found to be vigorous and are being taken up for further study.

4. Longevity studies of weed seeds.—The fortnightly germination tests of the seeds of *Trianthema portulacastrum*, *Acanthospermum hispidum* and *Echinochloa colona* were continued on filter paper and in sand media. From the tests so far done it is seen that there is no significant dormancy in *Trianthema portulacastrum* and *Acanthospermum hispidum*. *Echinochloa colona* shows a long period of dormancy.

The effect of sun drying on the viability of the tubers of *Cyperus rotundus* was studied. Similar study was also taken up with the uniform sized stolons of *hariali* (*Cynodon dactylon*) during the period. It was found that there is a correlation between the moisture content and the viability in both the above species.

Fresh collections of seeds of the above weeds were done to study the comparative germination between old collection and fresh and find out any significant increase or decrease in germination. Fortnightly germination tests were conducted under laboratory conditions.

5. Germination studies in flowering annuals.—Monthly germination tests on the freshly collected seeds of zinnia, cosmos, gillardia, marigold, tithonia and hollyhock, initiated in April 1960, were continued during the period under report. These seeds were

germinated over moist filter paper and in sand under laboratory conditions. The trend of germination in these media in respect of each annual has been plotted separately.

Zinnia.—In zinnia, peak germination of 92 per cent in filter paper and 81 per cent in sand were recorded in the sixth and eleventh months in filter paper and sand respectively. Deterioration in germination followed the peak germination. Owing to the inconsistency in germination, it was not possible to find out whether the seeds actually exhibit dormancy.

Gillardia.—In *Gillardia* seeds, peak germinations of 64 per cent and 66 per cent were recorded after eleven months from the date of collection. In this case also the deterioration followed the peak germination. Dormancy was observed in these seeds for a brief period of about one month.

Hollyhock.—Seeds of *Hollyhock* did not germinate consecutively in either case for two months, thus exhibiting dormancy during that period. Peak germination of 5 per cent and 6 per cent were recorded during the third month from the date of collection in both the media. In this case, the germination had been consistently very poor from August, 1960 onwards.

Marigold.—Peak germination of 80 per cent and 82 per cent in *Marigold* seeds were recorded after nine and eight months from the date of collection, in filter paper and sand respectively. Rapid decline in germination was noticed after the eleventh month in both the cases. The seeds were dormant for about one month.

Tithonia.—Peak germination of 65 per cent and 95 per cent in this species were recorded after 15 and 13 months from the date of collection over the filter paper and sand respectively. There was no germination for about three months in these seeds.

6. Pretreatment of grass seeds.—The seeds of two grasses *Cenchrus ciliaris* and *C. Setigerus* pretreated with different concentrations of potassium sulphate and potassium nitrate showed that potassium nitrate had no effect in either breaking the dormancy or increasing the viability. Potassium sulphate recorded an increase of up to 12 per cent germination in a few instances. Further trials failed to show any definite result in confirmation of its beneficial effect. Incidentally it was observed that the germination percentage of *C. ciliaris* and *C. Setigerus* decreases after 24 months of storage.

Since the two chemicals, potassium sulphate and potassium nitrate were found to be ineffective, the same experiment was continued using concentrated sulphuric acid, and Gibberellic acid of different strengths with varying periods of soaking. *Panicum antidotale* and *Cenchrus glaucus* were taken up along with *Cenchrus ciliaris* for this study. The results so far obtained have

shown that concentrated sulphuric acid has definite effect in increasing the viability of seeds up to 44 per cent over the control while gibberellic acid has not shown any satisfactory results so far.

7. *Studies on the germination and dormancy of some South Indian vegetable seeds.*—The studies were concentrated on seeds on Bendai (*Abelmoschus esculentus*), Cluster bean (*Cyamopsis psoroloides*), Ribbed gourd (*Luffa acutangula*), Tomata (*Lycopersicon esculentum*), and Brinjal (*Solanum melongena*) collected from Tirurkuppam, Thimmapuram, Paramakudi, Ambasaviudram and Periakulam. Seeds of Bendai showed no dormancy and maintained consistently good germination percentage of well over 80 per cent. Cluster Bean also recorded good germination percentage over 70.

8. *Weed Control by herbicides.*—Trials were conducted using different herbicides on *Solanum eleagnifolium*, *Cyperus rotundus* and *Cynodon dactylon*. It was observed that a 5 per cent concentration of Alpha, 4 chlora, 2 methyl pheromoxypromic acid was effective in killing the aerial portions of *Solanum eleagnifolium* and *Cyperus rotundus*. But the effect lasted for only three months.

"Dowpon" (2, 2 dichloro propionic acid) was tried on nut grass (*Cyperus rotundus*) and Hariyali at the rate of 15 lb. per acre. The aerial portions were killed in about a week and no regeneration was seen for over 8 months in pots. Fields scale trials were in progress. The action of Dowpon was completed within three hours after application.

9. *Economic Botany and Routine Acclimatization Trials.*
(i) *Green manures.*—The following green manures, viz., *Tephrosia noctiflora*, *Indigofera eblongifolia*, *Crotalaria juncea* (Southern Rhodesia and local), *Crotalaria brownei*, *Crotalaria verrucosa*, *Sesbania speciosa* and *Sesbania aculeata* were being maintained. From the preliminary studies conducted under the wet land conditions to compare the performance of different green manure as *Sesbania speciosa*, *Sesbania aculeata*, *Crotalaria juncea* Local and S. Rhodesia), *Sesbania kirkii* and cluster beans CP 78, the maximum yield of 88,835 pound per acre in *Sesbania speciosa* followed by 43,560 lb. in *Sesbania aculeata* was recorded. *Sesbania kirkii* was found to be of vigorous growth, flowering in 45 days.

(ii) *Soil Conservation Plants.*—A number of species of legumes and grasses were under trials for selection as soil conservation plants. Seeds of *Elionurus hirsutus*, a grass species were received from the Central Arid Zone Research Centre, Jodhpur, during the period and a good percentage of germination was seen in a week after sowing and good growth was observed. It appears to be promising as a soil binder.

(iii) *Fibre plants* :—A good collection of bast fibre and leaf fibre plants is maintained in the Botanical Gardens. The fibre value of *Abutilonhirtum* was studied and it is expected to have a good future as a bast fibre.

(iv) *Seed Testing* :—During the period under report, 620 samples of cotton seeds, 15 samples of daincha seeds and two samples of *Indigofera* seeds received from various departmental officers were tested for their purity and germination and the results were communicated to them.

10. *Supply of seeds and planting materials* :—Seeds and other planting materials of several plants were supplied to the public and other departmental officers during the period under report for popularisation of the same. The distribution of the materials include grasses like *Panicum antidotale*, *Bloubuffel*, *Cenchrus ciliaris*, *Cenchrus setigerus*, *Brachiaria mutica*, *Pennisetum purpurium*, *Pennisetum Polystachyon*, *Panicum maximum*, *Cynodon plectostachyon*, *Urochloa mosambicensis* and *Chloria gayana*, legumes such as *Centrosema pubescens*, *Clycine javanica*, etc., and other plants as Kapok—an extra long variety, introduced from the Far East.

Cytogenetics.

The cytology of *Pennisetum ruppellii* was studied in detail. The most common association during diagenesis was 9" plus 9'. The other associations were 13" plus 1'; 10" plus 7'; 11" plus 5'; 12" plus 3'; One bivalent and one univalent were attached to the nucleolus. The bivalents separate as usual while the univalents divide and separate or give rise to anaphasic bridges. In a few cases, the univalents do not divide and move to poles at random.

The meiosis of *Pennisetum souamulatum* was also studied. At diagnosis a maximum of 9 quadrivalents has been observed for the first time and this lends support to the suggestion that *P. Squamulatum* may be an autoallopolyploid comprising in its somatic complement a 9 chromosome genome represented in autotetraploid condition and another 9 chromosome genome in diploid condition. In some cases, one sexivalent has been observed per cell and this indicates that all the genomes are highly homologous to one another.

The cross between amphidiploid of *Pennisetum typhoides* X *P. purpureum* (2n=42) and *P. typhoides* (2n=14) was tried. The hybrid seeds obtained from the cross did not germinate.

The plants raised from the cross, diploid desynaptic Sorghum x Triploid (2n=30) hybrid of Johnson grass and Grain sorghum was studied. The plants are vigorous, dark green leaved. Mostly

bivalents are formed. These are probably hybrids involving the fusion of unreduced gametes of the desynaptic plant and triploid hybrid. The study again revealed the homology of the cultivated sorghum and Johnson grass.

Hybridisation between *Oryza malampuzhaensis* and diploid *Oryza sativa* parents having failed, attempts at interspecific hybridisation between the two species was tried at tetraploid level but there was no seed setting.

Thirty five species of Vitaceae have been collected so far. Of these thirty species have established well. Sixteen wild species were added on during the period under report. Morphological description for two species were recorded.

New features in *Cissus quadrangularis* Linn (var) flat stemmed, and foliar and floral variations both in *Cissus Quadrangularis* and *Tetrastigma sulcatum* Gamble have been recorded for the first time.

The diploid chromosome numbers in eight wild species were confirmed.

Study on the external morphology and Karyotype revealed the closer relationship between cultivated grapes and *Ampelocissus* species.

8. PLANT PHYSIOLOGY.

The main items of research were foliar nutrition of crop plants with macronutrients, studies with growth regulating chemicals and weed control studies.

Foliar nutrition studies :—Studies on paddy both in the field and in pot cultures were continued with the major nutrients, viz., N, P and K which were sprayed in the form of Urea, ammonium phosphate, super phosphate and Potassium phosphate. It was observed that the yield differences due to treatments were statistically significant only under pot-culture conditions. The experiment will be repeated during the coming season.

Studies with growth regulating chemicals :—Studies have been started on paddy and cholam in the laboratory and in the green house to test the effect of the growth promoting chemical Gibberellic acid separately as a foliar spray and as a pretreating agent for seeds prior to sowing, with the concentration ranging from 5 ppm to 400 ppm.

Weed control studies :—A new weedicide named Amitrol-T (Aminotriazole) of the Agromore company, Bangalore, is being tested out in the field and in pots for its efficacy against *Cynodon dactylon* and *Cyperus rotundus*.

9. FODDER RESEARCH SCHEME.

I. Maintenance and preliminary study of a collection of grass and legumes :—During the year under report 117 species of grasses, legumes and non-legumes were introduced both from foreign countries and within the country. Pot and field trials were conducted and the promising ones among *Panicum maximum* (Ten types), *Chloria gayana* (five types), and Napier grass (five types) were isolated. Among the exotic grasses *Phararia tuberosa* from Australia, *Daetylis glomerata* from Food and Agricultural Organisation, Rome, were promising. Among the legumes cow-pea, FOS 1 and Cow-pea No. 10 from Hissar, Punjab showed promise and will be taken up for extended trials. *Medicago sativa* from Punjab and Food and Agricultural Organisation, Rome also showed promise under potted conditions. Among the non-legumes *Atriplex vasiearin* from Hosur has given good vegetative growth in pots. *Stenotaphrum secundatum* from Washington (U.S.A.), has performed well under shade in garden-land conditions. The performance of many more species introduced viz., *Panicum antidotale* (pistiless) Indian Council of Agricultural Research Institute, New Delhi, *Paspalum conjugatum* and *Paspalum dilatatum*, etc., are under observation.

II. Character studies.—The generation experiment was continued with *P. antidotale*, *C. glaucus* and *C. ciliaris* collected during four seasons of the year to find out the seasonal effects if any on their viability. The generation per centage was fluctuating and erratic and the data did not indicate any trend.

III. Manurial trial.—(a) *Grasses*.—A fresh trial with four grasses under ten treatments was laid in October, 1960. Two harvests have been taken so far.

(b) *Lucerne*.—A fresh trial was laid out with lucerne also with five treatments. This was laid out in May, 1961 and there is a good stand of seedlings in the field.

IV. Introduction of promising leguminous fodders and studying rotations.—The rotation study was in progress. The crops of (1) Ragi (2) *Crotalaria juncea* and *Phascolus trilobus* (3) and Chitrai cholam were raised and the data gathered.

V. Yield Trial.—An yield trial with three grasses to be harvested at the three different stages of growth was started under irrigated conditions. The slips which were planted in March, 1961 were allowed for establishment.

Under the rainfed conditions the third years' yield data was gathered for 12 grasses. The result indicated that *Cenchrus glaucus* and *Heteropogon contortus* were the highest yielders closely followed by *Setaria nervosum* which was almost on a par with *Heteropogon contortus*.

VI. Trail of short duration fodder grasses grown alone or with legumes under gardenland and rainfed conditions.—The experiment was laid out under gardenland conditions and (1) Ragi was raised as the first crop followed by (2) *Phaseolus trilobus* and *Crotalaria juncea* and the succeeding crop of (3) *Pennisetum pedicellatum* and *Zea, Mays*, and the data gathered.

Under rainfed conditions an observational trial conducted with *Sorghum* and *Pennisetum*, *Pedicellatum* grown alone and in combination with five legumes indicated that *P. pedicellatum* gave better yield in combination with velvet bean and *Sorghum* when grown with cow-pea than the rest of the combinations tried.

10. CYTOGENETICS (FODDER GRASSES—SCHEME).

Research.—Collection and growing of species of grasses, of fodder value indigenous to the Madras State.—Twenty-six species of grasses belonging to 24 genera were added on to the existing collection and other morphological features recorded. Trials at induction of tetraploidy by treating vegetative buds with colchicine (aq) of different concentrations have been attempted.

Study of cytology of species and interspecific hybrids.—The haploid chromosome numbers of 34 collections comprising 17 species belonging to 15 genera have been investigated. The study showed occurrence of a pentaploid ($n=25$) in *Apluda varia*, tetraploid and hexaploid in *Chloris* (*chloris polystachya* $n=10$) and *Digitaria marginata* ($n=9$). The chromosome of *Panicum maximum* formed a maximum of four quadrivalents at meiosis indicating duplication of some chromosomes (Diploid, Triploid $n=10$ and 15 respectively, and aneuploid plants ($2n=2$ and 24) have been obtained among the progeny of a seed sample received as schima sulcatum.

Interspecific hybridisation.—Interspecific hybrids have been secured between *Zea mays* ($n=10$) and *Euchæna* (*Zea*) *mexicana* ($n=10$).

Attempts at hybridisation between Co.11 *Sorghum duarum* var *coimbatoreum* and *Sorghum halepense* have been made.

Scheme for micronutrient studies on crop plants.—The scheme for micronutrient studies on crop plants jointly financed by the Indian Council of Agricultural Research and State Government was implemented on 24—3—1961 with a view to study the optimum range of in-take and effect of micronutrients like copper, manganese and zinc on crop plants, viz., Paddy, Brinjal and Onions, with particular reference to their yield.

Preliminary green house experiments with Brinjal was commenced to study the effect of micronutrients applied in the form of foliar spray on growth, flower, production and yield. The experiment was in progress.

11. AGRONOMY.

Agronomy Wing.—(i) Tillage-cum-manure and irrigation on garden lands in field No. 44.—The statistical analysis showed no significance for cholam and cotton. In ragi the significance in grain yield was nil; in straw 3 acre inches gave better yield than 2½ and 3 acre inches. In manure the straw yield was greater with increase of manure. In tillage also no significance with regard to increased irrigation was obtained.

2. Rotation experiment.—Rotation experiment in Field No. 52. The inclusion of a green manure in the rotation increased the yield of crops but it was not economical as the total value of crops in rotation under intensive system was greater.

3. Tillage experiment in wet lands on paddy.—No conclusive results were obtained. Application of 5,000 lb. green leaf increased the grain yield and not straw.

Analytical and Advisory Wing.—(1) Four hundred and forty samples were pending on 1st July 1960, the receipts during the year were 412 making a total of 852 of which 532 samples were analysed under items—soils, manures, foodstuffs and fodder, plant products, water and miscellaneous. The balance pending at the close of the period on 30th June 1961 were 320 samples consisting of 302 (soils), 13 (plant products).

Simple fertiliser trials scheme.—The response of nitrogenous fertilisers was observed for all the crops like paddy, cholam, ragi, sugarcane, cotton, tobacco, response for phosphorous and potash was observed for cane in Salem and on the borders of South Arcot District.

A total of 635 trials plots were laid out during the year under report.

Bhavaniagar Soil Investigation Scheme.—Soil samples and plant materials drawn from the field experiments (viz.)

- (1) Variety of legume experiments.
- (2) Dose of organic matter experiments.
- (3) Method of soil amendment experiments.

One hundred and twenty-three plant materials were taken and analysed as per programme for Nitrogen Phosphorous, Potash and Moisture. Twenty-four samples were analysed for physical properties and pH.

Conclusion.—(1) In the legume trials, dew gram increased protein content of Cumbu grain better than others.

(2) Super phosphate application increased the P_2O_5 content of Cumbu grain.

(3) *Sesbania* with super phosphate increased the K 20 content of Cumbu grain. Under soil amendment, Farm Yard Manure was the best from the point of view of quality of Cumbu grain. Under organic matter experiment, organic matter applied in the form of green leaf seemed to improve the quality of Cumbu grain (Protein per cent and K=20).

Soil Survey on sugarcane crop and classification of dry soils contiguous to the cane tracts of the Madras state.—During the period, manurial schedule studies in South Arcot and North Arcot Districts for sugarcane in different soil zones were conducted after studying the agronomic practices, cane yield and juice quality of different zones. A manurial schedule for sugarcane will be prepared for the different zones.

Compost Scheme.—During the period under report, compost samples, urban and rural 462 and 300 samples respectively, were received for analysis out of which 454 urban and 300 rural were analysed, leaving at the end of the year only eight samples. Thus a total of 754 samples were analysed.

To study the efficiency of sieved and unsieved compost manure, pot culture experiment was started at Coimbatore in June, 1961 and was in progress.

Indian Council of Agricultural Research Scheme for the Chemical Investigation of the cause of blast resistance in paddy.—Two field and one pot culture experiments were carried out for the third year of the scheme as per Indian Council of Agricultural Research Technical Programme. Samples of blast resistant plants of paddy Co. 4 and blast susceptible ADT 10 variety at the tillering and boot leaf stages were grown and got ready for analysis. Third leaf samples for concentration of silicated short cells in the leaf epidermis were examined. The intensity and extent of blast infection in the paddy crop were examined. The total silica and free amino acids were analysed.

Conclusions.—(1) Blast infection was noticed only on the leaves of A.D.T. 10 and not on Co. 4.

(2) Neither the different forms of Nitrogen nor the levels and combinations of nitrogen and potash had any significant influence on blast infection.

(3) The application of nitrogen and potash influenced the increase in up-take of silica and formation of silicated cells on leaves; the increase being more marked in susceptible variety A.D.T. 10.

(4) Most of the free amino acids present in higher concentration in susceptible type.

(5) Among the six nitrogenous fertilisers used sodium nitrate, ammonium nitrate and ammonium chloride produced more of the Amino acid than the rest.

(6) Application of nitrogen reduced concentration of acids markedly in resistant variety Co. 4.

(7) The potash was also found to depress the formation of some of the free amino acids in the resistant paddy.

(8) Of all the nitrogenous fertilisers sodium nitrate was inferior.

Fertiliser Control Order.—During the period 296 samples were received 129 samples were pending on 1st July 1960 making a total of 425 of which five were rejected as ill packed. The rest totalling 420 were all analysed.

Black soil Pilot Scheme.—The scheme which was sanctioned for three years, started functioning from 15th April 1960 with its headquarters at Kovilpatti. The area covered Tirunelveli district with seven Fieldmen and an Assistant to help.

Work in the seven centres was started in September, 1960. The cultural and varietal trials were conducted on Cumbu and Cotton. The performance of cotton was quite satisfactory compared to the crop in the ryots fields.

In cumbu the line sown crop stood adverse seasonal conditions better than the broadcast crop. In cotton K. 2 was better than K. 6. On statistical analysis of the data there has been no significant result either in the cultural trial or the varietal chemical manurial trial. There is a general indication that lighter black soils respond more to the improved practices recommended than the heavier types.

Assistant Botanist—Soil Conservation Scheme—Biological Measures.—The scheme was started on 13th July 1960.

Twelve grasses and 15 legumes were sown in the nursery area of the scheme as part of collection and maintenance. Only *Portulaca elator* among the grass has come up well. In legumes, the germinated plants were under observation. In Bhavanisagar, nine grasses and several legumes were raised in the nursery to serve as reserve material for character study pertaining to soil conservation. Under irrigation five grasses and five legumes came up well. Character studies of grasses and legumes like spread, soil binding, forage nature, etc. will be taken up on further growth at Qoty. At Bhavanisagar, three grasses under observations were seen to possess good soil conservation properties (viz) *Stenotaphrum secundatum*, *Stenotaphrum dridiatum* and local grass *Trachys muricata*. *Trachys muricata* grass possessed good characters and was taken up for further study during summer.

Special study on trials in terraces in the hills and on the bunds in plains on some eight grasses was taken up. *Cynodon plectostachyon* grass was studied in respect of its binding qualities.

In conclusion, the grasses and legumes raised in the nurseries were under study. It is too early to assess the results.

At Ootacamund, suitable plant species for the faces of the terraces, viz., seven grasses, one legume and one species of scented *Geranium* were established. Economic results of the improved types are too early to assess.

Indian Council of Agricultural Research Scheme—Up-take of phosphorus.—With the object of studying the effect of application of leguminous green manures fertilised with different types of phosphates to paddy, experiments were laid out at three centres in the State, viz., Aduthurai, Coimbatore and Tirur. The data secured so far do not show any significant yield difference. The analysis of soil and plant materials collected from the experimental plots were in progress.

Indian Council of Agricultural Research—Research studies on adoption of improved Agricultural practices.—Coimbatore.—1. Operational studies on the scheme and their economics were taken up on 20th March 1961 as per G.O. Ms. No. 3534, Food and Agricultural, dated 24th October 1960. All the taluk headquarters were visited and the conditions studied and 75 villages each for Coimbatore South and Salem South were fixed up with Headquarters for village investigations. Holdings were grouped under different heads and crop particulars are gathered.

District Investigation for Economics of Irrigation in Coimbatore District.—A preliminary survey from the data of joining of the officer on 8th March 1961 was started. Forty-five villages were selected at 5 villages per taluk.

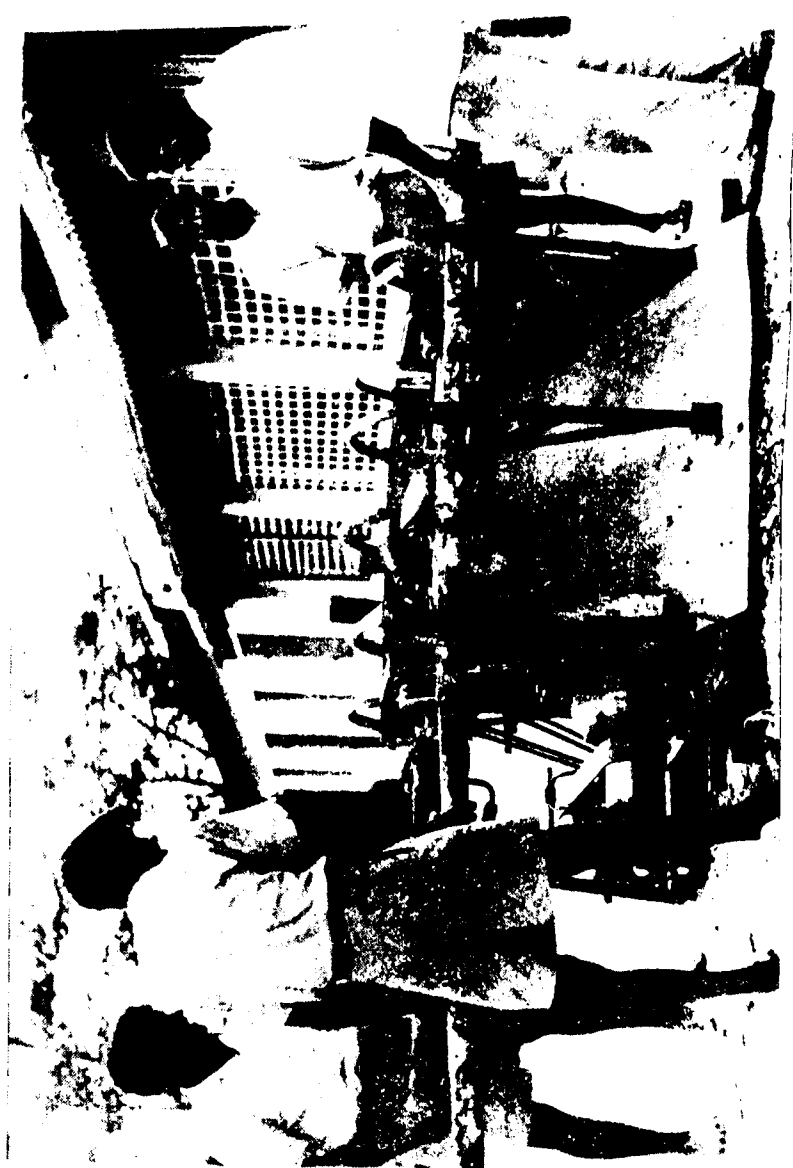
12. AGRICULTURAL ENGINEERING RESEARCH.

(1) *Overhead Irrigation.*—After the performance of one of the sprinklers fabricated in the workshop, a complete set of four units were manufactured and installed in field No. C.1 and C.2 of Cotton Breeding Station, Coimbatore. The effects of spray application of water on a crop for a season will be studied in the observation plot.

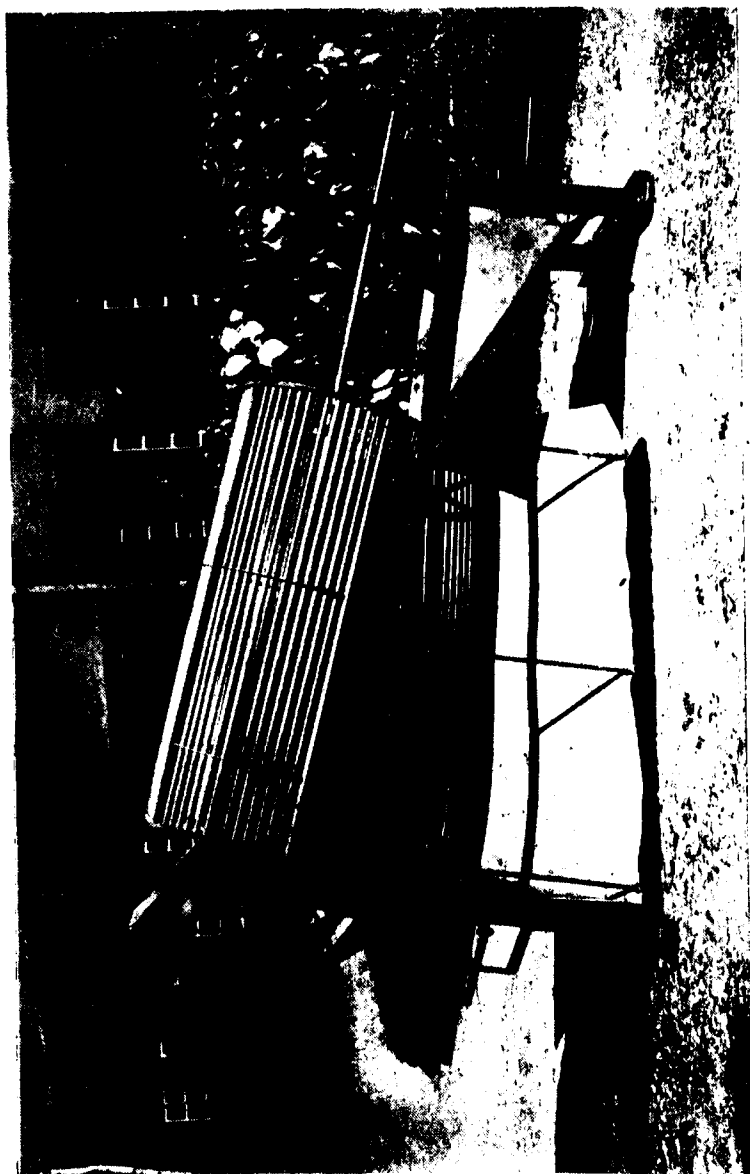
(2) *Cotton Fineness Tester.*—As the results obtained during previous years were considered to be not adequately consistent with the results obtained through conventional method, further extensive trials with 50 more samples, limiting the pressure to 20 lb. in the air chamber and the time taken for the fall of pressure from 20 to 5 lb. one square inch were recorded for



COTTON FINENESS TESTER.



BARK STRIPPING MACHINE.



COMPOST SIEVING MACHINE.



SPRING TYPE DYNAMOMETER.

various strains. The results compiled have since been sent to the Director, Cotton Technological Research Laboratory, Bombay for study and comments.

(3) *Bark stripping machine*.—The bark stripping machine previously developed was modified so as to facilitate the removal of bark from logs fed from both the sides. Eventhough there was not much of jerk, still there was some strain on the operator. With a view to minimise the strain, spring loaded log holders have been provided and the unit is to be sent to Cinchona department for extensive trials.

(4) *Compost Sieving Machine*.—The rotary compost sieving machine received from the Indian Agricultural Research Institute, New Delhi, was modified as follows :—

- (1) Provision of pedal drive to the sieving rotar.
- (2) Provision of G.I. sheets metal deflectors for diverting the falling sieved compost.
- (3) Provision of deflector to enable the falling alien matters at a distance from the sieved compost so that they do not get mixed.

The machine is capable of sieving $4\frac{1}{2}$ tons of compost in one hour incurring an expenditure of 24 nP. per ton.

(5) *Spring Type Dynamometer*.—Hitherto the drafts of bullocks drawn implements were recorded by introducing a dial type spring balance between the yoke and the shaft poll of the implement. The readings could not be relied upon due to too much of oscillations of needle and inaccuracy. Hence a spring type dynamometer was developed with oil damping arrangements. The design consists of a $\frac{3}{8}$ inch by 2 inches steel spring of one foot in length, a draft shaft on bush bearings and a housing for the spring. The damping rod which is connected to one end of the spring runs through a bearing and the cylinder, and ends with a hitching eye. The other end of the spring is rigidly fixed on the frame. An indicator attached to the spring, slides through a slit on the frame. The graduated sides of the slits in the frame directly reads the animal draft. The range of the dynamometer is 50 lb. to 250 lb. A self recording instruments has also been incorporated.

(6) *Boring set*.—After completing the lifting machanism, a trial run was made with the boring set with an artificial tool weight of 100 lb. to study actually the vibrations and forces among various numbers. The vertical members required to be strengthened to withstand the impact. The crank shaft previously made of mild steel developed a slight crack.



GADGET FOR MECHANISING HAND BORING OPERATION.

The crank shaft was replaced with another to take up a safe load of 5 H.P. The clutch housing shaft, mainshafts housing the crank and main bearings were splined with provisions for keys to give better grip for fly wheel and clutch assembly. Balancing counter weights were incorporated in the fly wheels. The unit was installed just in front of the workshop and tested.

(1) The drive speed for the ropehousing and winding shaft now obtained direct from the clutch shaft is high and consequently the pulling power exerted to lift the tool, sandshell, etc., is inadequate. Therefore, a reduction gear should be provided in between the clutch and rope winding shaft.

(2) The top members should be further strengthened to take up heavy shocks. Suspending work on this design, the percussion type boring well set was fabricated and installed in the front of the workshop. Though the set worked alright at this stage it was evident that structural members will have to be strengthened further as the tool had not penetrated deep enough. Also fabrication of suitable gadget to convert the hard boring sets into power units was thought of. The design consists of two pulley sets to reduce the normal engine speeds and a cranking arrangement to convert the rotary power into reciprocating action. The wire rope from the winch passes through a pulley attached to rocking arm which pulls down the rope. The fabrication works was completed and the units was commissioned in front of the workshop for a trial bore of 100 feet with a view to study the defects in the design.

(7) *Wooden Hand Level*.—The cheap levelling instrument designed previously was further modified as follows:—

(1) Provision of ball bearing at "T" Centre.

(2) A graduated arc, marking the degree of incline, was provided at the centre.

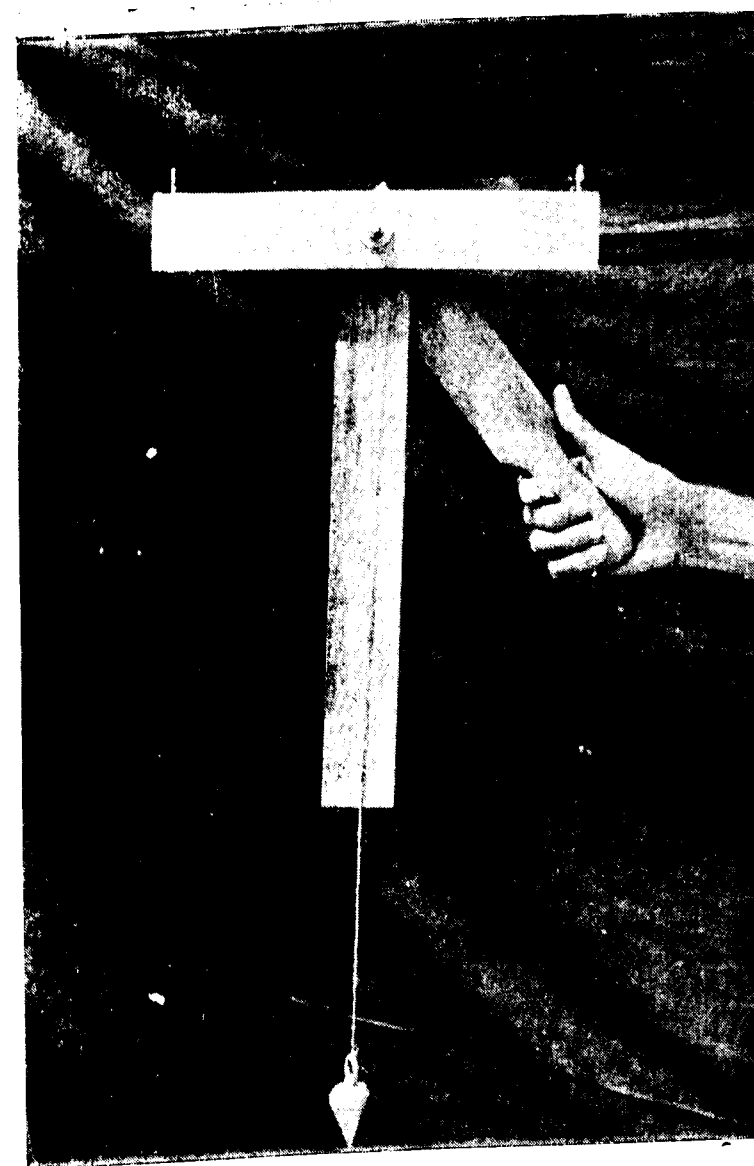
(3) A vertical view hole with cross wires as in the case of prismatic compass was also incorporated. The error with the above instrument was only 2 to 4 per cent.

This compared favourable with the Ghat tracers manufactured by firm like P. Orr & Sons, provided the target was always kept within about 15 feet from the observer.

This can be safely used for contour farming and marking contour strips for strip cropping, etc., by the farmer.

This needs no technical skill and hence will be a very useful tool for the farmers in adopting the appropriate followup measures for soil and water management.

The cost of this device is about Rs. 15.



HAND LEVELING INSTRUMENT.

(8) *Angle dozer equipment for building work in soil conservation projects.*—At present the bunding work in Soil Conservation Projects are being done either by engaging bulldozers or by manual labour. There are adequate number of wheel type tractors in the department which can be effectively put to use during off seasons, if a suitable device that could be worked by hitching to it, is designed. Accordingly a suitable device was fabricated. A five bottom mould board plough of John Deere make was suitably altered removing the mould board accessories, and a 10 feet long blade of average 2 feet height was fabricated with necessary support points. As this was not provided with a member to take the side thrust during the preliminary trials conducted at the Central farm fields, it was observed that the implement had a tendency to serve the tractor to one side while trailing. A side thrust plate was therefore incorporated and trials were conducted at Chettipalayam in one of the soil conservation projects. After marking out the bund line by direct contouring method, two strips of 6 feet in width were ploughed with a disc harrow leaving intermittent space of 6 feet along the bund line. The implement designed as above was then hitched behind the tractor and worked. A maximum bund of 1 foot and 3 inches height and 3 feet base was obtained. Further modifications were under way to increase the earth-moving capacity of the scraper blade so as to obtain the required bund size.

At one run, the dozer blade was able to penetrate only 2 inches to 3 inches even though the soil was loose.

After the first sweep when the implement was worked for the next strip so as to further move the soil already collected in the form of a small bund, there was no soil on the thrust blade side, since the soil in the first strip is already removed and consequently the implement leaves its correct position of cutting and collecting and gets pushed on to one side due to lack of side thrust.

If the implement is worked in the same place again and again, this difficulty was overcome. The implement was worked in two strips of 5 feet each cutting and pushing the soil from each strip to the centre. A bund height of 1 foot 3 inches and 3 feet 6 inches base was obtained with this. Even by repeated working, the bund height could not be increased as the height of the bund is directly proportional to the height of the blade.

The following modifications are in progress—

(1) Raising the height of the blade by atleast 1 foot at the rear.

(2) The side thrust blade should be lengthened by another 14 inches since it was often found that the thrust balancing is not sufficient of the cut.

(3) The front end should be caved in by about 4 inches so that there will be better penetration for the blade.

Further trials will have to be continued.

9. *Improved Keni*.—The 'Keni' or the ordinary earth grader is commonly used in soil conservation projects of Bombay. Another implement of almost the same design is being used in soil conservation works in Nilgiris. But there are several defects in this device. It was therefore decided to improve upon this implement in order to render its working more efficient. The first field trials conducted at Soil Conservation Projects, Coimbatore, revealed that the implement was not able to penetrate effectively into the soil. The implement was suitably improved upon so as to use the same both as an earth scoop and also as a tyned cultivator on the otherside.

Accordingly the implement was modified for use as cultivator by providing tyes, on one side. The rope hitch points and the handle brackets were so altered as to enable the implement to be tilted and used as a soil loosening cultivator. The object was, the implement should be first worked as a cultivator and soil should be loosened. Thereafter the blade should be reversed and used as a scoop for moving the soil for bunding and terracing operations.

10. *Gadget for making fertiliser pellets*.—Attempts were made to fabricate a gadget for the manufacture of fertiliser pellets. The trials conducted so far have not been encouraging. Hence further modifications are proposed to be carried out.

11. *Table Model Paddy Shelter*.—A table model paddy sheller without polishing the bran has since been developed and the performance is satisfactorily. The out-turn economic data on its working, etc., are being collected.

Test, trials and Demonstrations

Land Master Tractors.—The Division of Agricultural Engineering of Indian Agricultural Research Institute, New Delhi, sent two 'Land Master' garden-type tractors to Madras State for extensive trials and report. The Assistant Agricultural Engineer (Research) who was deputed to Delhi in this connection brought them and conducted extensive trials in the representative tracts of Madras State.

Though the low cost of capital investment is very attractive (i.e. Rs. 1,500 including one set of implement), the machine being a petrol driven one, the cost of working and maintenance is rather high. The machine can be successfully used for puddling lighter sandy soil to a depth of about 6 inches for paddy cultivation. It is ideally suited only for gardenland cultivation.



IMPROVED 'KENI'.

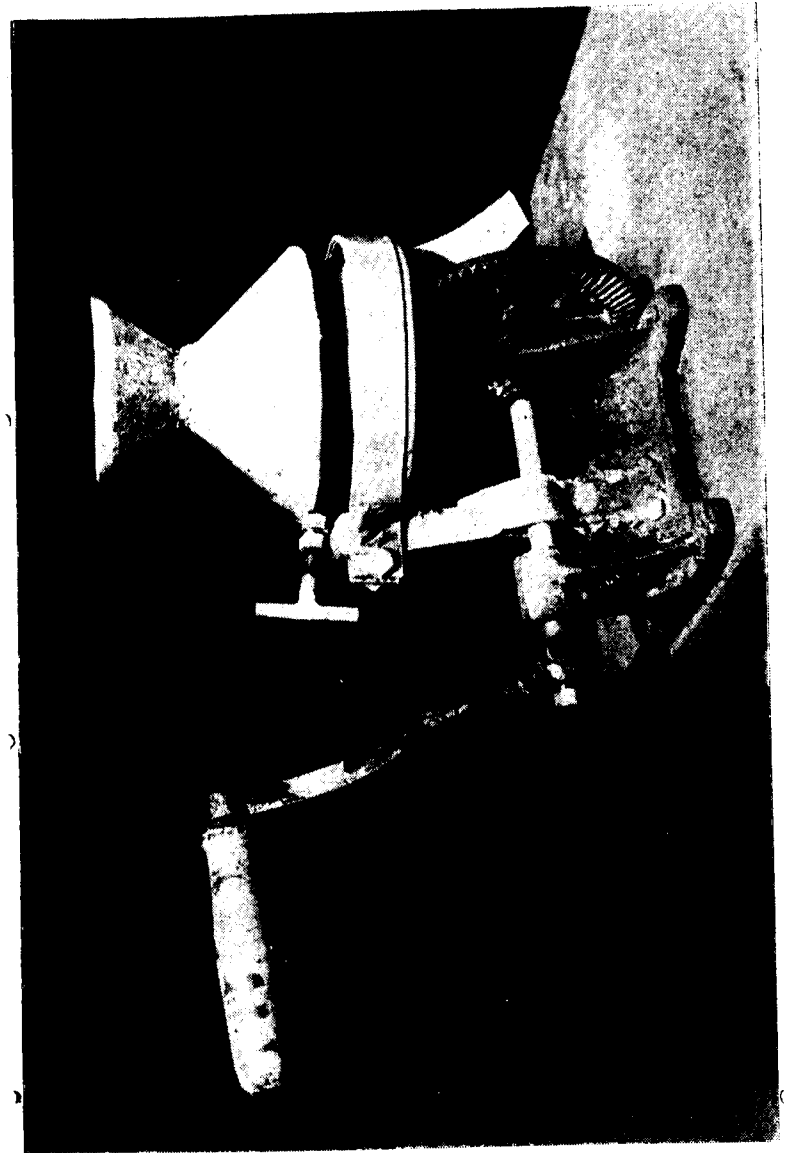


TABLE MODEL PADDY SHELLER.

2. Chinese Type Paddy Transplanter.—After seeing the Chinese type paddy transplanter at the First World Agricultural Fairly, New Delhi, attempts were made to fabricate a proto-type. Meanwhile two transplanters, one manually operated and the other bullock drawn, manufactured by Messrs. Krushi Sadhan Kendra, Billimora were purchased for trials.

These devices were tested at Paddy Breeding Station, Coimbatore, at the farm of Annamalai University, Chidambaram and at Nagercoil, the representative Paddy Growing areas of the State.

The hand planting machine received from Messrs Krushi Sadhan Kendra, Billimora was very flimsy; the prongs or the catching fingers did not work uniformly and members also gave way even during the first trials.

The hand planting machine received from Messrs. Krushi shops it was at first apprehended that the picking fingers might damage the seedlings stem. It was decided to plant one plot of about 5 cents with this, and watch the growth compared to the adjacent plot planted by conventional hand method with the same spacing.

The growth revealed no significant difference which confirmed that picking fingers do not hurt the seedlings appreciably in it all it did. It was however revealed that the operator required some experience before he starts planting with speed, regularity and uniformity.

With the alterations found necessary during the above trials, spacing guides and increased forward slope for the float bottom were provided and three more pieces of these planters were fabricated at the workshop for further trials at Coimbatore and other places. Trials were also conducted at Annamalai University, Chidambaram and the results confirmed that these hand planters are certainly promising and may eliminate much of labour involved in line planting of paddy crop. Further trials will have to be carried out however before a perfect design can be passed on to the ryots.

As regards bullock-drawn transplanter, it was not possible to work it in our conditions for the following reasons.

(1) The draft required is too high and even two pairs find it difficult to pull the implement.

(2) After carrying out certain modifications to the bottom drum and varying the picking clearance dummy trials were conducted. Since the dummy trials did not indicate any definite improvement in the working, the machine was taken to Chidambaram for further tests. Here also the result was not encouraging.

First and foremost the draft required was too high to manoeuvre even with two pairs of animals and turning at head lands was impossible and as such further test had to be abandoned.

(3) *Touche-Gurma*.—This is almost similar to Japanese Type Rotary Weeder, manufactured at the Central Workshop and Stores, Nagpur. This was tested at Central Farm Fields for weeding the line planted paddy crop.

Scheme for the study on advantages and economies of Mechanised Farming.—This scheme was started on 8-8-1960. Three Supervisors styled as investigators were appointed to study and collect data on the economics of mechanised farming in the districts of Coimbatore, South Arcot and Thanjavur.

CROP IMPROVEMENT WORK.

(A) Paddy.

(i) *Improvement by pureline selection*.—Pureline selection work was in progress in 26 local popular varieties in the different rice research stations of the State.

Eight selections from Tiruchengode samba, a popular variety largely grown in the Kalingarayan Channel area of Erode taluk, were under yield trials with the ryots' bulk as standard at the Paddy Breeding Station, Coimbatore.

At Aduthurai, three promising cultures of Mattaikurnvai were compared for yield against the standard in the Kuruva season. Two cultures, 3025 and 3062 recorded significantly higher yields than the control with an increase of 11.4 per cent. The selection work in the varieties, Pulithipiratti, Kuliadichan, Banku and Varigarudan samba was a failure at the Agricultural Research Station, Paramakudi, partly due to the failure of rains and partly due to floods.

At Ambasamudram, among the three cultures, 962 875 and 895 on Maikuruvai variety put under yield trials against Maikuruvai in normal and heavy manuring conditions, culture 895 recorded the highest yield under both levels of manuring. Cultures 639, 659, 662, and 679 of Seenganni variety were tried in yield trials with the standard in two levels of manuring. Culture 639 and 679 recorded 15.6 per cent and 14.2 per cent more yield than the standard under the normal and heavy manures respectively. Yield trials of Arikiravi and Sembuli selections were also continued.

At Pattukottai among the nine selection studies in Mattaikurnvai, four were found promising and they were carried forward for next years' study. Pureline work in Kattavellai, Kodaivellai and Kaivarisamba varieties was also continued.

At Palur, among the three Sornavari cultures tried, one culture 8,812 was found to be superior to the other two cultures TKM. 6 and PLR. 2. It was found that none of the selections was superior to the PLR. 1 standard in the Seevan Samba series. Twenty-one Thuyamalli Samba selections were compared against the Thuyamalli standard and Co. 30. In two series but none yielded more than the standards. In ottakar and vellakar cultures, two cultures in Mottakar and one culture in Vellakar were found to be superior to the other cultures and standards respectively.

At Tirurkuppam, two cultures in Vadansamba, sixteen in Kappa samba, two in Chinnasamba, three in Kappakar, eight in Mottakar and two in Kesari were found to be better than the respective standards. Three short duration types in Navarai and four in Sornavari season were found promising.

(ii) *Improvement by hybridisation*.—Since special problems of the tracts have to be solved by studying the large number of progenies obtained by making crosses between desirable parents and fixing up suitable high yielding cultures, a number of crosses were made during the year besides studying the available hybrid materials.

(iii) *Specific crosses for combining useful characters*.—At Coimbatore, the pure breeding cultures isolated from Kavunginphoochala X GEB.24; two cultures in each of Co.2, Co.3 and Co. 8 duration and three in Co.14 duration were sent for trial to study their performance in cultivators' holdings. The above crosses were made to obtain the land dense panicle character of Kavunginphoochala and the profuse tillering habit of G.EB.24. As a result of the study of the ten cultures (under yield trials) obtained from the crosses effected between departmental strains Co.10 and Co.13 and the Japanese and Australian types, to have the bunchy panicle and non-lodging characters in Co.10 and Co.13, culture 31,602 gave the highest yield. To combine the bunchy panicle character and fine grain quality of the Bombay types with the heavy tillering of GEB. 24, crosses were made between Bombay types like Zinnia, IB-12-11 and Kolambo and GEB-24. Among the progenies studied under yield trials, one culture 31,909 recorded the highest yield of 3,790 lb. per acre which was 22;9 per cent more than the standard. To induce the compact panicle character of ADT. 17 and PIR. 1 in Co. 19, crosses were made and four cultures were put under yield trials. One culture 31,952 was found to give 6;9 per cent more yield than C. 19. A total number of 92 F-2 progenies consisting of 3268 single plants of crosses between ASD 1 and eight Japanese types was fixed for further study to fix up the promising ones having the non-shedding nature of grain in ASD-1 with good yielding capacity. The study in the evolution of short duration strains possessing non-lodging character of Chinese type (CH 62 in ASD-1) resulted in fixing up 904 single plants in F.2.

At Aduthurai four cultures, i.e., 2030, 2031, 2032 and 2033 of cross ADT.16 and GCB.24 were under yield trials in the evolution of strains possessing non-shedding character of ADT.16. Six cultures of the crosses between short duration department strains and Chinese varieties were carried forward for yield trials to evolve short duration strains possessing stiff straw. Thirty-nine progenies of CH.2 × ADT.3 were under preliminary yield trials at Pattukottai. At Palur, on culture 4555 evolved by crossing PLR.1 and Co. 19 with a view to improve the rice quality of PLR.1, was found to yield equally well as PLR.1.

At Tirukuppam, ninety nine selections from the cross of GEB. 24 × Co. 10 were found to be promising. One hundred and twenty-eight cultures in Co. 10 × Burma types were also fixed up for further study.

(iv) *Evolution of high fertility strains.*—Crosses were effected between departmental strains and Japanese types to evolve strains possessing high response to fertilisers with non-lodging character. At Coimbatore, 39 progenies of Japonica × indica were put under yield trials against ADT.12 and GEB.24 in both normal manuring and heavy manuring in five series. The progenies recorded increased yields ranging from 0.7 per cent to 279.5 per cent over the standard. At Aduthurai out of sixteen cultures of japonica × indica put under yield trials, four cultures recorded higher yields than the standard. Nine pure breeding cultures were also fixed up for yield trials during the next kuruvai season. The studies at Palur resulted in fixing up on nineteen high yielding cultures of short duration and ten of medium duration for further study. Forty-four cultures of japonica × indica progenies were under yield trials at Tirukuppam. At Ambasamudram among the fourteen sets of crosses between ADT.12 and japonica varieties 158 single plants were selected for further study and among the four sets of crosses between GEB.24 and Japanese types 127 single plants were carried forward for further study.

(v) *Introduction.*—A total number of 2,571 types and varieties of both Indian and exotic origin is being maintained morphologically pure and studied at the Paddy Breeding Station, Coimbatore, and their economic attributes are being exploited.

Among the six Chinese varieties tried, three varieties, CH. 41, CH. 62 and CH. 63 were found promising and hence these varieties were tried in the districts. Labhandi, a cross of Luchai × Gurmotia × Burma obtained from Madhya Pradesh, yielded 20-30 percent more yield than GEB. 24 when tried in Coimbatore districts. None of the Cuttack varieties recorded higher yield than Co.2 when they were put under yield trials at Coimbatore.

At Aduthurai, all the Cuttack varieties recorded significantly higher yields than the standards. At Pattukottai among the six Chinese varieties tried, CH.45 and CH.2 have given better yields

than standards. In inter-strain yields trial, ADT.9 recorded the highest yield in the kar season, while PTB.15 in medium duration strain and Co.25, BCP.2 and BCP.1 in long duration strain gave higher yields. At Ambasamudram, ADT.9 recorded highest yield i.e., 4,438 lb. per acre which was 6.9 per cent more than the standard ASD.1. At Palur, culture 1246 was found to give more yield than GEB.24 and the Labhandi culture.

(vi) *Crop Improvement by induction of mutations.*—Mutations were attempted to be created among the existing popular strains by treatment with chemicals like benzene vapour, cerasan and acenaphthene and by X-rays to select economic variants by observation and trials. On the whole, 11 mutants derived from Co.2, Co.13 and GEB.24 were tried in cultivators' holdings. All the mutants recorded higher yields than the respective standards.

The most important departmental strains, viz., Co.13, TKM.6, Co.29, ASD.1, TKM.1, GEB.24, Co.13, ASD.5 and Co.25 were irradiated with Cobalt 60 gamma rays on 1st February 1960 and 2nd February 1960 in Atomic Energy Pavilion, World Agricultural Fair, New Delhi. The seeds were subjected to irradiation with 15,000 R and 10,000 R respectively. A total number of 871 promising plants were selected for further study.

(vii) *Estimation of natural cross pollination in rice.*—An experiment to ascertain the extent of natural cross pollination in rice was initiated at Coimbatore and Aduthurai in 1955-56 with suitable strains. During 1960-61, Co.4 was used as the male parent and Co. 19 as the ovule parent. The percentage of natural crossing is under estimation.

(viii) *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 the different spacing and three levels of manuring. It was found that lodging could be controlled to some extent by adjusting the spacing manurial doses.

(ix) *Manurial experiments.*—(a) To find out the differential response of the varieties to different doses of manure, the popular departmental strains of different durations were tested at Coimbatore, Aduthurai, Pattukottai, Tirukuppam, Palur and Ambasamudram in strip plot design with five levels of nitrogen, i.e., 0 lb., 15 lb., 30 lb., 45 lb. and 60 lb. In combination with 0 lb. and 30 lb. K.20 over a basal dressing of 5,000 lb. green leaf and 150 lb. super per acre. It was found that there was no advantage of increasing the nitrogen level from 45 lb. to 60 lb. per acre for getting increased yields in medium and long duration series. Response to nitrogen in all the series has been clearly established.

(b) *Fractional application of ammonium sulphate experiment.*—To obtain the maximum utilisation of ammonium sulphate in its application to paddy crop, an experiment was conducted to find out superiority of the split application and the time of application at Coimbatore, Aduthurai, Pattukkottai, Ambasamudram, Palur and Tirurkuppam. Application of ammonium sulphate in split doses was found to be better than applying in one dose in all the centres except Aduthurai.

(c) *Calcium ammonium nitrate experiments.*—To assess the value of calcium ammonium nitrate as a nitrogenous fertiliser an experiment was conducted at Coimbatore during navarai season with nine manurial treatments and with the strains Co.29 CAN contains 20.5 per cent N and 36 per cent CaCO₃. Treatment 9, i.e., application of 45 lb. N. as ammonium sulphate and 79.05 lb. CaCO₃ over 5,000 lb. green leaf and 15 lb. super as basal dressing recorded the highest yield followed by treatment 3, i.e., applying 45 lb. N as CAN—half applied at planting and the balance half the quantity applied 30 days after planting over 5,000 lb. green leaf and 150 lb. super per acre.

(x) *Cultural experiments—Pre-soaking of paddy seeds in sodium bicarbonate solution.*—Seeds soaked in sodium bicarbonate solution were reported to have given more yield than the untreated seeds in China and to test this, a co-ordinate trial was conducted at Coimbatore, Aduthurai and Palur. At Coimbatore, the treated seeds in all the treatments, i.e., seeds soaked in 2.8 per cent, 4.8 per cent and 6.8 per cent and 8.8 per cent solution of sodium bicarbonate recorded increased yields ranging from 3.8 per cent to 13.6 per cent whereas at other centres no difference in yield was observed.

(xi) *Scheme partly financed by Indian Council of Agricultural Research.*—(1) *Scheme for the evolution of strains resistant to blast.*—The scheme was in operation for the eight years at two centres, viz., Coimbatore and Aduthurai to evolve strains in the short, medium and long duration strains resistant to blast to cater to the needs of the ryots in different soil climatic zones. So far, three long duration strains, viz., Co.25, Co.26 and ADT.25 one medium duration strain, i.e., Co. 30 and one short duration straining Co. 29 were already realised. A total of 12 pure breeding and high yielding cultures was multiplicated and sent for district trials. A total of four selections from direct crosses and 117 selections from back crosses was isolated in short duration group. Sixteen medium duration cultures underwent yield trials in the ryots' holdings. Further 44 promising cultures were put under trials for their yield and disease resistance. Of the 53

types belonging to short, medium long duration groups, 53 proved to be susceptible to the disease in varying degree and the remaining 25 types free from disease.

The results from the monthly planting trials confirmed the results obtained in the previous years, but during this year, the short duration varieties got affected by blast even in the trial planted during November. At Aduthurai there was no incidence of blast disease. The trials will be repeated.

(2) *Scheme for the evolution of drought resistant strains.*—A total area of about 3 lakhs acres is grown under rainfed paddy in the State and hence the necessity arose to evolve superior drought resistant strains to satisfy the needs of the ryots. The scheme was in operation at Coimbatore and Tirurkuppam. The work in the scheme involved the study of 293 rainfed and semidry varieties for their drought resistance. Five varieties, viz., ASD.4, TKM.1, Ariyan, Arunjothi and Patraipisini were found to give more yield under drought conditions. Hybrid progenies of crosses between wild rices and high yielding strains and between the rainfed varieties were also studied. Studies on development of the root system and on size and frequency of stomata in leaf, leaf sheath and stem in resistant and susceptible varieties were also continued.

(3) *Scheme for the evolution of short term rice strain possessing seed dormancy.*—The scheme was started on 20th January 1960 with Coimbatore as the main centre and Aduthurai as sub-centre. Over ten lakhs of acre are grown under short duration varieties and most of them are non-dormant and begin to germinate during harvest time if it coincides with wet weather. To avoid such losses short duration dormant strains have to be evolved. The work involved the study of the pure breeding culture under yield trials, and 201 progenies obtained from the crosses between non-dormant exotic types and dormant departmental strains. Short duration types of the genetic stock of rice maintained at Paddy Breeding Station were also studied to fix up the most dormant types for use as parents, in further hybridisation programme. The study on the nature of inheritance and the physiology of dormancy was also under progress.

(4) *Scheme for the evolution of saline and alkaline resistant strains of paddy.*—The scheme was started on 17th December 1959 with headquarters at Coimbatore and later transferred to Peravurni, Thanjavur district from 1st June 1960. The object of the scheme is to evolve superior saline and alkaline resistant strains of paddy suitable to the different tracts. The study involves the collection of varieties and testing them, under alkaline conditions. Out of 110 varieties, 36 varieties were found promising. None of them recorded higher yields than SR 26 B. One thousand and seventy-one hybrid progenies of 16 sets of crosses were also studied. Crosses were also made between departmental strains and SR 26 B

and T. 892 to evolve strains having high yielding capacity under alkaline conditions. No difference was observed between resistant and susceptible varieties when they were studied anatomically.

(5) *Scheme for the evolution of strains for inundated areas.*—The scheme was in operation at Talainayar, Thanjavur district since 17th October 1959. During the year, 56 varieties were collected from the States in India and other Countries. Of these 18 varieties had the flowering duration of 105 days corresponding to the local kar. Two varieties from Assam, i.e., T. 2047 and T. 2077 were found promising. The results of four cultures of Thiruthurai-poondi kar and three of Kattuvanam under yield trials showed that cultures, 2172 and 2100 of the former gave 16 to 20 per cent increased yields and 2589 of the latter gave 9.2 per cent increase over the respective standards. Among the 19 hybrid cultures tested for yield, culture 4731 of the cross Co. 10 × Burma types and 3489 and 3485 of Co. 1 by PTB. 15 recorded up to 193 per cent more yield than Thiruthuraipoondi kar though they yielded less than PTB. 15.

(xii) *Seed distribution.*—A total quantity of 1,65,193 kgm. of nucleus paddy seeds was produced for supply to the State Seed Farms and Extension Officers during the period and a quantity of 1,37,065.90 kgm. was distributed.

(xiii) *Progress of research and how far the results of research have been transmitted to the ryots and the economic gain to the ryots.*—The Department had realised two important strains Co. 29 and Co. 30 during the period under report. These two strains are resistant to blast disease, having the maturation period of 115 and 165 days respectively. Including Co. 29 and Co. 30 the Department has released so far 74 strains and many of these are widely grown. The release of the two blast resistant strains mentioned is one of the many outstanding achievements of the section. The area covered by the improved strains has been estimated as 37.25 lakhs acre and there is possibility to increase the area still further through the extension staff employed in National Extension Service and Community Development Schemes.

By the use of improved seeds, application of organic and inorganic manures in proper time, timely use of fungicides and pesticides in the control of diseases and pests, adoption of various recommendations advocated in the modified method of paddy cultivation the acre yield of paddy has been increased from 1,998 lb. to 2,017 lb. during the year. The area has been increased from 57.26 lakhs acres to 59.13 lakhs acres during the year. The prize winners in the crop yield competitions obtained phenomenal yields as they used the departmental seeds followed by the various agricultural operations recommended by the Department.

(B) Millets.

Cholam.—Cholam, the major millet crop of the State is grown annually in about 18 lakh acres. The crop is highly drought resistant and is largely grown under rainfed conditions. The important rainfed varieties of cholam are periamanjol cholam, talaivirichan cholam and irungu cholam; and the important irrigated varieties grown during the summer season are vellai cholam and sen cholam. From the Millet Breeding Station, 19 improved strains of cholam representing the more important varieties grown in the State were evolved and released for general cultivation. These strains are superior to the local varieties and yield 10 to 30 per cent more and are also popular in the tracts for which they are evolved. Research work for the further improvement of the crop is being continued at the station and a brief account of the work done and the results achieved during the year are presented in the following paragraphs:—

(a) *Periamanjol Cholam.*—Periamanjol cholam is the most popular variety grown under rainfed conditions in Coimbatore district. Strain Co. 1 of this variety has pithy stalks and blackish purple straw. Work was in progress to evolve in this variety a better strain with juicy stalks and reddish purple straw. During 1960 monsoon season, two juicy stalked selections with reddish purple straw, A.S. 9071 and A.S. 9079 (Derivatives of the cross between A.S. 8002, a selection with reddish purple sheath and A.S. 8112 with juicy stalks) were compared with the Periamanjol cholam strains Co. 1. Though these selections were on par with Co. 1 they gave 30 and 17 per cent increased yield of grain respectively over the standard. In straw yield, the selection A.S. 9071 gave 6 per cent more yield over Co. 1 and was on par with it.

With the same object in view, the fodder cholam strain Co. 11 was crossed with the two selections A.S. 8002 and A.S. 8112. Fourteen selections from the progenies of these crosses were sown and studied in 1960 monsoon season and materials were taken from 11 of them for further work.

With a view to tone up fodder quality of strain Co. 1, it was crossed with the fodder cholam strain Co. 11 and four selections were under study in observation plots.

(b) *Talaivirichan Cholam.*—In this variety, five improved strains have been released and they are under spread in the districts of North Arcot, South Arcot, Salem and parts of Tiruchirappalli. Of these five strains, Co. 19 was found to be plastic and suited for the entire tract. Eight economic derivatives of crosses between the high yielding Talaivirichan cholam strains and bold grained and juicy stalked types of the same variety and two other economic pureline selections were compared with Co. 19 and Co. 2 in

two groups of comparative yield trials. In one group (with pearly white grains) the yield differences were not significant, for both grain and straw. In the group with chalky white grains, excepting the selection A.S. 9625, all the rest were on par with Co. 2 (standard) in the yield of grain; in straw yield two selections, viz., A.S. 9098 and A.S. 9641 were significantly superior to the standard.

(c) *Irungu Cholam*.—Irungu cholam is a fodder variety commonly grown in the southern districts of the Madras State exclusively for fodder purposes. The Periamanjai Irungu cholam strain K. 3 is an improvement over the irungu cholam strain K. 1 and is very popular. Work on the further improvement of strain K. 3 was continued and a juicy stalked selections A.S. 8810 was compared with K. 3 in comparative yield trial during 1960. The juicy stalked selection gave 39.5 per cent more grain yield over the control and was significantly superior to it.

From the progenies of crosses between K. 3 and A.S. 8110, the juicy stalked Periamanjai cholam selection, 104 selections were made from 28 progenies for further study.

(d) *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 under spread. With the object of evolving a better strain with bold grains and juicy stalks, selection A.S. 7589 (with bold grains) was crossed with A.S. 8206 a juicy stalked mutant. From the progenies, 22 families were advanced to compact family block trial in 1961 summer season.

Four selections from the above mentioned progenies were again crossed with strain Co. 18 to tune up the grain yield and 25 F₂ progenies of these crosses were sown in 1961 summer season for study and selection.

In some parts of the region where sen cholam is grown, types with pink grain are preferred. For the evolution of high yielding strain of this type, six pink grain types were compared in a replicated row yield trial with Co. 4 and A.S. 7589 in 1960 summer season. The strain Co. 4 was found to be the best yielder. Five of these selections were however advanced to preliminary yield trial in 1961 summer season.

(e) *Vellai Cholam*.—Ten vellai cholam strains (with duration ranging from 85 to 120 days) and one grain-cum-fodder strain maturing in 95 days have already been released from the Millet Breeding Station, Coimbatore, 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. Nevertheless, the pink wash on its grains is considered a disadvantage in some regions and hence work on the elimination of this defect was taken up. Strain Co. 18 was crossed

with Co. 12 and selection K.S. 288 to evolve pure white grained strains with juicy stalks. Selections with pure white grains were also advanced from separate collections and also from the spontaneous mutants obtained during the course of breeding work. A total number of nine such selections were sown in two groups of comparative yield trial in 1960 summer season along with the strains Co. 12, and Co. 18 K-2. In one group, the selection A.S. 9755 gave 5.9 per cent more yield of grain over the control. In the other group the yield differences were significantly for both grain and straw and four selections were on par with Co. 18 in grain yield. The trial was repeated in 1961 summer season.

The Sorghums of Bombay tracts have translucent pearly white and uniformly bold grains. But these varieties are not adopted for this tract. With the object of evolving a strain with the agronomic qualities of the Vellai cholam and the grain of the Bombay sorghums, the Vellai Cholam strains Co. 18 and K-2 were crossed with the Maldandi Jowar (M. 47-3) of Bombay. The F₂ progenies were under study in 1961 summer season.

(f) *Hybrid Sorghums*.—The preliminary work on the exploitation of hybrid vigour for stepping up production in Sorghum was continued during the year. Crosses were effected between the cytoplasmic male sterile lines obtained from U.S.A. and the Indian types. All the local types tested proved to be restorers of fertility.

(g) *Non-lodging, leafy, straight peduncled sorghum*.—Though the American Kafir Sorghums, have juicy stalks, they do not lodge and are also heavy yielders of grain. But the quality of the grain is very poor. So to evolve a high yielding, non-lodging type with straight peduncles and also quality grains, crosses were effected between the American type and strain Co. 18. The F₄ progeny of these crosses were under study for the isolation of selections with desirable combination of characters.

(h) *Fodder Cholam*.—With a view to evolve a fodder cholam strain which can be cut for fodder in less than 90 days, crosses were effected between fodder cholam strain Co. 10 and Senia Jowar, an early fodder type from Bombay. The F₂ progeny of these crosses were under study. For improving the quality of fodder further, it was crossed with Sorghum Leoti, a sweet variety from U.S.A. and the F₃ progeny of these crosses were also under study.

(i) Work on the Scheme for the evolution of drought resistant strains of Sorghum was initiated during the year. A total number of 191 single plants representing derivatives from one synthetic tetraploids were grown and studied and 59 selections taken for further work. The hybrid between the antitetraploid sorghums and the selected synthetic tetraploid showed a greater introgression of the cultivated characters. Crosses were effected between diploid *S. halepense* and *S. roxburghii* and crossed recombinants taken for further work.

R
T. 211 X 260

Cumbu.—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 in March 1959. Since then, breeding work on Cumbu had to be restricted to a few items, namely, maintenance of germ plasma bank, testing inbreds by polycross method for combining ability and compositing superior inbreds into synthetics and testing the synthetics for yield.

During the period under report, two crops of Cumbu one under rainfed conditions and the other under irrigation were raised and studied. Two hundred and ninety-three inbreds (of both medium and short duration) were raised and studied in detail. They were selfed and seed materials in each were taken for further studies.

In a trial with single crosses, top crosses, pycrosses, synthetics and their 15 inbred parents, the polycross lines of five inbred parents recorded significantly higher yield than their respective single crosses, top crosses and inbred parents. These five inbreds were utilised for the production of a synthetic. The synthetic so produced was tested with its parents during 1960 monsoon season and was found only equal to the inbred parents.

During 1959 monsoon season, five other short duration synthetics were tested and it was found that the F-1 progeny recorded higher yield than the parental mean. These synthetics were again tested against strains Co. 3 and X-3 in 1961 summer season. The crop was on the field.

During 1960 monsoon season, seeds of F-1, F-2, F-3 and F-4 progenies of medium duration synthetic (Syn. I) were tested in a preliminary yield trial for comparison of yield among the variants. The results revealed that the synthetics were only equal to their inbred parents.

Work on the scheme for the rapid multiplication and distribution of hybrid cumbu seeds was continued and a total quantity of 23,087 lb. of hybrid seed was produced and distributed to the cultivators through the Agricultural Extension Officers.

Ragi.—In the Madras State Ragi is grown over an area of 10 lakhs of acres with an annual production of 5 lakhs tons grains. The demand for seeds continued to be heavy.

Two promising short duration sections, viz., E.C. 4713 and E.C. 4728 were vested in comparative yield trial against strains Co. 7 and A.K.P. 1 as standards. The results showed that Co. 7 and E.C. 4728 were significantly superior to the standard strain A.K.P.1 recording 72 per cent and 22.1 per cent increased yield of grain respectively. As selection E.C. 4728 has proved consistently superior to the strain A.K.P.1 in all the five years of trial held at this Station, it has been issued for district trials.

Ragi strain K-2 possesses non-lodging habit coupled with tolerance to the 'Blast' (Piricularia) disease. But it has a long duration of 135 days. The latest strain Co.7 ragi is of 100 days duration only and responds well to heavy manuring. But it has a tendency to lodge and is susceptible to 'Blast' disease. Hence crosses are being effected between K-2 and Co. 7 Ragi for evolving a high yielding and non-lodging strain which will mature in 100 days.

Minor Millets.—(Varagu, Samai, Tenai, Kudiraivali and Panivaragu).—The two improved strains in Varagu Co. 1 and PLR. 1, Samai Co. 1, Tenai Co. 1, Co. 2 and Co. 3 and Panivaragu Co. 1 are under distribution in the districts for which they are suited.

In the rust resistant studies with the Japanese varieties of Tenai, 31 selections were studied for their yield and tolerance to rust. Due to want of adequate incidence of the disease, precise observations could not be made on the resistance of the types to the disease.

(G) Pulses.

General.—Pulses occupy an area of 12 lakhs of acres in the Madras State. They are generally grown as mixtures with millets and oilseeds. Redgram, Horsegram, Blackgram and Greengram are some of the major pulses. One improved strain in each of Redgram, Greengram, Horsegram and Bengalgram has been released for general cultivation. A total quantity of 3,182 lb. of seeds of improved strains was distributed during the year.

(a) **Redgram.**—A total of 219 types was sown and studied during the year. Five high yielding, long duration Redgram selections were selected for yield trial for comparing against strain S.A. 1. The three short duration Redgram selections that were tried in a comparative yield trial with 'Thenkasi' type as standard did not fare better than the control.

(b) **Greengram.**—A total number of 93 types was grown and studied. Five economic selections were compared with strain Co. 1 in the comparative yield trial. Selections 1535/1 recorded 47 per cent higher yield than the control followed by selection 1535/2 and 1535/4 with increase of 34 per cent and 32 per cent respectively. However, 1535/4 was consistently superior. The strain Greengram Co. 1 was multiplied for distribution.

(c) **Blackgram.**—Ninety-three types of Blackgram collected from Madras State as well as from outside were sown and studied. Nine economic cultures evolved by pure-line selection were tested in a comparative yield trial with No. 212 (standard). All the cultures yielded better than the standard and selection No. 1766 (from Srivaikuntam) was the highest yielder in the group with an acre yield of 469 lb.

(d) *Horsegram*.—Sixty-three horsegram types collected locally and from outside the State were raised for observation and maintenance. Seeds of the existing improved strain Co.1 were multiplied for distribution to cultivators. Three early maturing types were compared with the strain Co.1 in a preliminary yield trial, under dry land conditions. Though type 2 of Sankarankoil, gave 28 per cent increased yield over Co. 1, the yield differences were not statistically significant.

(e) *Lab-lab*.—Work in the scheme for the evolution of new varieties of *Dolichos lab-lab* partly financed by the Indian Council of Agricultural Research was continued.

Twelve new samples were added to the germ plasm bank. These along with 258 types already maintained at the station were grown and studied and 166 types were retained. The lab-lab types collected from Thadagam hills appeared to be comparatively more tolerant to drought and insect pests and diseases. Seven field bean types were compared with D.L. 231 in yield trial. As in the previous year, selection D.L. 2542 was on par with D.L. 1458 and significantly superior to the other selections tried, the increase in yield over standard being 31.9 per cent. This selection was found to be promising as a green manure crop also. From the crosses effected in previous years for the improvement of quality of pods in field bean, 280 single plants were studied and 79 were advanced for purification and study.

(f) *Cowpea*.—One hundred and thirteen cowpea types were studied during the year in observation plots and eight high yielding selections of cowpea, were compared in yield trial, with economic type C. 57 as standard. None of the cultures gave higher yield than C-57.

The vegetable cowpea type E.C. 455 was popular and 57 lb. of seed were produced for distribution. The grain types C-57 and C-521 were also multiplied and seeds secured for distribution.

(g) *Cluster bean*.—Twenty-two types of cluster bean were grown and studied. In a preliminary yield consisting of six types with C.P. 78 as control, conducted for isolating the best variety for yield of seed, C.P. 79, and C.P. 78 were found to be the best giving 853 lb. and 613 lb. per acre respectively. Earlier trials have focussed attention on selection C.P. 380 as ideal for green manure-cum-vegetable purposes. The variety Pusa Mousmi, received from the Indian Agricultural Research Institute and tried at the station was found suitable for direct introduction as a vegetable type. It yields long, fleshy and sweet pods (vegetable). The acre yield works out to nearly 3,000 lb. of green pods. The earliness in flowering observed in this variety is an additional advantage.

Chillies.—The work on the Indian Council of Agricultural Research Co-ordinated Scheme for the Improvement of chillies in Madras State was continued at Agricultural Research Station, Kovilpatti. The yield obtained during the year were below normal due to excessive rainfall received in November and January. Selection and study of cultures in different stages of trials were continued. Crosses were made between high yielding and thrips tolerant varieties and the progenies were studied. Selection B-72-A of Assam origin which was consistently superior to local in trials at the station was tested in cultivators' holdings. It was found to be superior to the local types both in respect of yield and tolerance to thrips.

Practical achievements of Research in Millets and Pulses during the year ending 30th June 1961.—(i) The Periamanjol cholam culture A.S. 9028 tolerant to the root parasite striga awaits release as a strain.

(ii) A new juicy stalked selection A.S. 9079 has been evolved in Periamanjol cholam which is grown in about 3 lakhs acres in Coimbatore district.

(iii) Hybrid seeds of cumbu were multiplied on a large scale and 23,087 lb. of seed was distributed. This would have covered an area of 2.80 acres. The additional produce realised would be 300 tons of grain valued at one lakh rupees.

(iv) The high yielding Ragi selection maturing in 90 days has been issued for trial in cultivators' holdings.

(v) The black seeded field lab-lab selection D.L. 2542 was found to be highly promising as a green manure crop yielding 29,000 lb. of green matter per acre in 60 days after sowing.

(vi) In chillies, culture B.72 A of Assam origin yielded better than the local in trials in the districts and was observed to be comparatively more tolerant to thrips.

The distribution of seeds of improved strains was continued. The achievements and work in progress at the station were given publicity through the medium of Journals, Exhibitions, Village Leaders' Camps and refresher courses. A total quantity of 1,76,623 lb. of nucleus seed was distributed and these would have covered an area of 25,871 acres, and the percentage of spread of improved strains is 57 per cent for cholam, 62 per cent under cumbu, 77 per cent under Ragi, 27 per cent under minor millets and 32 per cent under pulses.

Economic gain to the ryots by the adoption of the results.—The improved strains of Co. 1, Co. 19, K-3, Co. 11, and Co. 18 in cholam, X-3 in cumbu, Co. 7 in ragi, SA. 1 in redgram and Co. 1 in horsegram continued to be popular. The improved strains have spread over an area of 84 lakhs of acres which is about 60 per cent of the total area under millets and pulses, the estimated additional production being 2.14 lakhs tons of grain valued at 6.4 crores of rupees.

(D) Oilseeds.

1. *Groundnut*.—Research work on groundnut was in progress with the main object of evolving strains with high yield, oil content, shelling out-turn and resistance to pests and diseases. Work on the agronomic aspects of the crop was also continued.

A high yielding semi-spreading selection A.H. 6719 yielding big sized kernels suitable for snack purposes was proposed to be released as strain TMV. 6. A spreading selection A.H. 6885 (East Africa) consistently superior to all the three standards in three years of yield trials at the Agricultural Research Station, Tindivanam and recording an average increase of 37.7, 16.0 and 25.6 per cent over the local and strains TMV. 1. and TMV. 8 respectively was multiplied for trials in the districts during 1961-62.

Two selections in the bunch and ten in the spreading varieties were in different stages of yield trials in comparison with their respective controls. The yield differences were found to be significant. One of the two bunch selections, viz., A.H. 6875 recorded 13.7 per cent increase over strain TMV-2, and was on a par with it. This registered an average increase of 8.4 per cent over TMV. 2 in three years of yield trials at the station. In the yield trials with the ten spreading selections, eight proved superior to the local, recording increased yield ranging from 20.1 to 48.9 per cent. One of these, viz., A.H. 6888, in the third year of trial, was found to be superior to strain TMV.1. This on an average gave increased yields of 35.3, 12.2 and 11.8 per cent over the local and strains TMV. 1 and T.M.V. 3 respectively. Bunch selection A.H. 6875 and spreading selection A.H. 6888 that gave encouraging results in three years of yield trial will be multiplied during 1961-62. Six spreading selections were multiplied for conducting preliminary yield trials. Thirty-six out of 200 single plant selections of the spreading variety collected from Melgudalur (Uthamapalayam taluk, Madurai district) out yielded their adjoining controls and were advanced to replicated row test. In the new cultural trials with four main and two sub-treatments conducted for the fourth year, the yield differences were not significant both in the main and sub-treatment. However, 'ploughing eight times with iron plough' in the main treatment and 'working danthies twice' in the sub-treatments yielding 12.7 and 6.9 per cent increase respectively over 'ploughing four times with country plough' (control) in the main treatment and working danthies four times' in the sub-treatments. In the spacing trials with the bunch varieties conducted for the fourth year, the yield differences were not significant. However, broader spacing between rows 12 inches by 3 inches, 9 inches by 4 inches and 18 inches by 2 inches recorded 11.5, 7.6 and 1.0 per cent increase over the normal spacing of 6 inches by 6 inches. In the fertiliser placement trials with two manure mixtures with two placements in each conducted for

the fourth year with the bunch variety, the yield differences were not significant. However, all the manure treatments gave increased yields ranging from 8.6 to 23.7 per cent over 'No manure' (control), M.M. 1 side placement recorded the highest yield. Thirteen high yielding selections comprising of five of the spreading and four in each of the semi-spreading and bunch varieties were tested in ryots' holing at 38 centres in the districts. The five spreading selections gave 22.0 to 53.1 per cent increased yields over the local varieties, A.H. 6795 recording the highest yield in most of the centres. The four semi-spreading selections registered increased yields ranging from 22.1 to 34.3 per cent over the local while the four bunch selections recorded increased yield ranging from 3.8 to 17.8 per cent over the local bunch.

2. *Gingelly*.—Under the programme to evolve high yielding types at Coimbatore, four selections were under Comparative Yield Trials with TMV. 3 as standards. Of the ten selections compared with strains TMV. 3 in two groups of yield trials, the yield differences were not significant, though five selections recorded increased yields up to 6.8 per cent over the local. One of the five, viz., S.I. 1225 (Gaya) yielded on an average 8.5 per cent increase over the local and as much as strain TMV. 3 in three years of yield trials at the Agricultural Research Station, Tindivanam. Seeds of this selection were multiplied during 1961 summer to obtain enough seeds for large scale trials in the districts during 1962. In the preliminary yield trial with ten selections in two sets, the yield differences were not significant. However, four selections registered increased yields up to 20.9 per cent over the local. Of the 47 selections tested in three series of Replicated Row Test, five selections registered increased yields up to 13.7 per cent over strain TMV. 3, though the yield differences were not significant. Treatment NPK, NP, NK and N were significantly superior to 'No manure' recording increased yields ranging from 28.7 to 36.5 per cent. The average of three years' results indicated the superiority of treatments NPK, NP, NK and N which registered increased yields ranging from 2.0 to 31.7 per cent over 'No manure'. Treatment N alone was found to be remunerative.

The yield trial with five selections conducted during 1956-60 cold weather season was repeated for the second year during 1960-61. Thirteen selections were compared with the local and strain TMV. 2 in two groups of Preliminary Yield Trial. Four selections were also tested under Replicated Row Test. The existing 30 varieties and eight fresh collections of Grecian origin were studied in detail. All the eight varieties from Greece were found to be a week earlier in duration than strains TMV. 2 and TMV. 8. Thirteen selections were under yield study during 1961 summer. Fourteen hybrids and 85 selections from the F. 2 and F. 3 progenies of crosses were studied in detail to spot out white seeded cosmopolitan strains.

3. *Castor*.—Genetical studies to find out the mode of inheritance of number of nodes to first inflorescence was initiated. Crosses were effected between Co.1 by local perennial, Co.1 by T.M.V. 1 and their reciprocals to evolve a perennial variety of castor for the plains. A total of nine local perennial varieties, two from Singampuneri, three from Pattukkottai and four from Gobichettipalayam were received and a germplasm bank is being set up. The seed characters such as weight of 100 seeds, length, breadth and thickness of seeds were studied.

Six medium duration selections were compared with the strains TMV. 1 and TMV. 2 in two groups of yield trials. The yield differences were significant. X. 118/2 (Horticultural type by TMV. 1) in the third year of trial recorded 37.4 per cent increase over TMV. 2 in three increased yields up to 39.5 per cent over strain TMV. 1 but was on a par with TMV. 1. This gave on an average 7.9 per cent increased yield over strain TMV. 2 in three years of yield trials and will be multiplied for district trials. In the preliminary yield trial with six short duration selections, two recorded 4.7 and 20.5 per cent increase over general mean, though the yield differences were not significant. In the Replicated Row Test with five medium duration selections, three registered increased yields up to 39.5 per cent over strain TMV. 1, though the yield differences were not significant. In the district trial with five short duration selections, all the five recorded increased yields up to 12.5 per cent over the local varieties. Eighteen crosses were made between selected parents to reduce the duration and impart colour to strains. Seventy-seven single plant selections were selected from F₂ and F₃ progenies of crosses for further studies. Five families of hybrids from the crosses between highly pistillate strain TMV. 1 and five high yielding inbreds were compared with strain TMV. 1 and the pollen parents in a compact family block. The yield differences were not significant either in the family or sib analysis. However, three hybrids registered increased yields ranging from 5.2 to 12.6 per cent over strain TMV. 1. Five new varieties, three from Marseilles and one irradiated material in each of strains Co.1 and TMV. 1 were studied. None of them compared favourably with Co.1 or TMV. 1. One hundred and sixty-one inbreds were maintained pure.

Brief summary of results actually achieved during 1960-61.

(1) *Groundnut*.—A.H. 6719 a high yielding bold seeded selection suitable for snack purposes was to be released as strain TMV. 6. An East African variety, A.H. 6885 has been selected to advance for district trial. Wider spacings in groundnut resulted in increased yields besides facilitating inter-cultivation by labour saving implements and thereby reducing cost of cultivation.

(2) *Gingelly*.—A high yielding selection, S.I. 1225 was multiplied for district trials. Gingelly crop appears to respond well to nitrogenous fertilisers.

(3) *Castor*.—The possibilities of obtaining higher yields by hybrid vigour have been indicated and the study is being pursued. Rainfed castor appears to respond well to the application of ammonium sulphate.

Whether the results of research have been transmitted to ryots—(1) *Groundnut*.—The selection A.H. 6719 has already received the favour of a large number of groundnut growers in the State. Wider spacing for groundnut has been practised by some of the ryots already.

(2) *Gingelly*.—The results are yet to be transmitted to the ryots.

(3) *Castor*.—The results of fertilizer application to castor have been published in journals and it has not reached the stage of practical adoption by ryots.

The economic gain to ryots by the adoption of the above results.—Since selection A.H. 6719 is the first snack purposes strain to be released in the State it is likely to become very popular. The cultivation of the spreading selection of groundnut is likely to give 20 per cent increased yield.

Fertiliser application to gingelly and castor may increase the production by 10 per cent and prove remunerative.

(B) *Cotton*.

(a) *Breeding for the unification of the winter Cambodia region of Madras under one adoptable American Cotton*.—Trials were laid out at Coimbatore in 1960-61 season with the 13 strains built up at Periakulam including PK. 599, PK. 863, PK. 924 and PK. 1053 with a view to test the performance of these cultures under irrigated conditions.

Four of these cultures recorded numerically higher yields over the standard new strain, MCU 3. The best among these will be carried out for study in the scattered block trials distributed in the entire winter Cambodia region, for isolating a strain superior to MCU. 3.

(b) *Trials with Desi and American Cottons for the Lower Bhavani Project area*.—The American strains MCU 1, MCU 3 and the 2 karunganni strains K.5 and K.6 were raised in one cent plots in a randomised design at Bhavanisagar under irrigated conditions. The object was to evolve a suitable type under the project conditions. The desi types were included in the trials as they were more hardy and resistant to pests and diseases while the Cambodia types were highly susceptible to black arm and jassids in the Lower Bhavani Project Zone. The yields reported were not encouraging and it is desirable to continue the trials.

(c) *Perennial cottons—Screening of.*—In the Moco elections, detailed studies on morphological characters, perennial habit and performance were made to isolate true to type moco typical plant with tufted naked seeds and perennial habit for further propagations.

Twenty-six perennial types were maintained and studied with a view to isolate a perennial type superior to Moco. The types surat tree cotton, Dharwar American and Exotic-3 were promising and gave finer and longer fibres.

(d) *Utilisation of wild germplasm.*—The hybrid derivatives from crosses involving the wild cottons *G. Raimandii*, *G. Thurberii*, *G. Armorianum*, *G. Tomentosum* and *G. Anomalum* with American and desi types were intensively studied for the transference of characters like resistance to jassids, blackarm and bollworm and high ginning percentage, fibre fineness and fibre strength. The *G. Raimondii* derivatives recorded high ginning percentage of 40 as compared to 36 of the standard. Resistance to jassid, was observed in the *G. tomentosum* hybrids. Blackarm resistance was evident in the *G. Raimondii* and *G. armourianum* hybrids. The anomalum crosses compared favourably with K6 in general performance with superiority in fibre characters.

(e) *Synthesising Asiatic and American Cottons.*—Mass scale crosses were effected between the Asiatic and American strains. The setting was rare. A few bolls developed to maturity and were suspected to be hybrid bolls. The seeds obtained from these were raised and studied for triploidy. Ultimately the off springs proved to be maternal.

Back crossing of the triploids was also attempted but no setting occurred.

(f) *Germination and seed viability studies.*—Trials were conducted on standardisation of method of germination test with samples of K6, MCU 1 and MCU 3. There was practically no difference in the germination between the various methods like blotting paper, gunny bag, sand medium and sulphuric acid treatment.

(g) *Breeding for a new barker gene.*—The crosses involving the petal spot mutant of P. 216 F, and the pigmented type Macnemara winesap with MCU 3, were studied and single plants with the distinguishing features like intense spot and pigmentation combined with good lint character were selected for further trial. The study aims at introducing a distinguishing morphological character as a marker in the improved strains to admit of easy spotting out of off types and enable even at very early stages off growth so as to maintain the purity at a very high level very easily.

(h) *Yard stick studies.*—In order to assess the influence of the improved cultural practices recommended for cotton, trials were laid out in replicated and randomised fashion with the treatments including two different manurial schedules, plant protection schedule, and combination of both fertiliser and plant protection measures. The differences in yield were not statistically significant.

(i) *Vicinity study on Cambodia Cotton.*—The study at the safe distance required to avoid natural contamination. To assess the natural crossing, the red bodied hirsutum type (R.U. 4/4) was raised in the centre, surrounded by MCU 1. The produce from the latter crop from different distance from the centre was collected separately. The progenies will be studied for hybridity in the coming season.

(j) *Inheritance of characters.*—The inheritance studies were carried out to locate the gene responsible for lintlessness in lintless Downy and to assess the inter relationship in between lint quantity mutants. The new lintless mutant was found to be due to a gene identical with that of lic in Punjab Hairy lintless.

(k) *Study of heterosis.*—The F1 hybrids involving MCU 3 with C. 1298, 199F, Empire cotton, 185 into Co. M, Samaru and Triang were studied for manifestation of hybrid vigour. Four combinations recorded higher yields over the better of the two parents. In mean halo-length, there was no evidence of heterosis.

(l) *Cytogenetic studies.*—Tetrad analysis of the triploid Co. 2 × armourianum (2n : 39) showed a high degree of tetrad formation of 88.8 percent though this hybrid remained sterile.

(m) *Study of megasporogenesis and megametogenesis.*—Section cutting with microtome was attempted with buds of different stages. No clear picture could be obtained on megasporogenesis.

(n) *Devising simple and inexpensive instruments.*—Under this programme an instrument was fabricated in collaboration with the Assistant Agricultural Engineer (Research) for separating light and in-filled seeds on the principle of air blow method (Winowing). This was tested for its suitability. The instrument was not perfect enough and failed to remove lighter seeds.

(o) *Cermplas Bank.*—A total of 600 varieties belonging to the four species of gossypium and representing the world collections was maintained and studied. Fresh acquisitions from Russia were added to the collection. The seventeen Russian types were found to be very early. Six types from Rhodesia were resistant to jassid and blackarm.

(p) *Response of cultures to varying levels of fertility.*—In the manurial trials with N, P and K, alone and with different combinations, the treatments NK gave significantly higher yield than the 'no manure'. The other treatments including N.P.K (40:20:20) were only on a par with control.

(q) *Experiment on the effect of varying levels in the intervals between irrigation and plant protection schedules.*—Preliminary trials revealed there was practically no relation between the time intervals following plant protection and the yield.

(r) *Time of sowing experiment with the new strain MCU. 3 at Bhavanisagar.*—Early sowings were found to give better crop than late sowing in Bhavanisagar. Seven treatments were included in the trial commencing from 15th August, at 14 days intervals. Late sowing resulted in the poor growth of the crop and susceptibility to pests and diseases.

Schemes.—(a) *Scheme for production of extra long staple cotton of 13/15" in Madras State at Srivilliputtur.*—The laboratory examination of the cultures under various stages of breeding trials in the scheme was completed. After thorough study of the data, the sowing programme was drawn up in accordance with the recommendation of the Expert Sub-Committee. The material sown during this season (1961 summer) comprised 12 strains in the Main Strain Trial, 15 in preliminary strain trial, 284 progenies in the Progeny Row Trial and a large number in lower generations. The crop is in the productive phase. Field study is in progress.

(b) *Scheme for the improvement of Tinnevelles and Karunganni Cotton in Madras State at Kocilpatti.*—In the scattered Block Trials the strain 9833-4 was promising. Of the 20 strains tested under Main strain Trial, the culture 0851 was significantly superior in yield, length and ginning. Strains 9833-4, 0161-C-6, and 9946-I-J recorded significantly better length and ginning. In the preliminary strain trial, one strain was superior in yield alone, two combined better length and ginning while ten others were superior in one of the attributes.

Actual progress made and results of research achieved.—The new strain MCU. 3 recently evolved under the winter combodia scheme, was found to be suitable under unirrigated condition also, thus fitting well for the entire winter combodia region. Attempts for evolving a more cosmopolitan strain possessing better economic values than MCU. 3 were in progress.

In the varietal trial at Bhavanisagar, American and Desi types were tested under replicated conditions. The results are awaited.

The prospects of screening Moco to get a true to type of plant and isolation of a perennial cotton better than Moco was encouraging.

In ashoreum-anomalum crosses, promising cultures with extra fineness and good strength were isolated. The derivatives of wild cotton (*C. raimondii*) were noteworthy for high ginning percentage with yield and length on a par with the standard.

No fruitful results were achieved in the attempts for synthesising Asiatic—American cottons.

The germination studies revealed that the method of conducting germination in sand media was convenient and more reliable in comparison with other methods.

In the marker gene studies, single plants with distinguishing characters like intense spot and pigmented body, combined with economical characters were selected for further trial.

Studies on 'Yard Stick' did not yield conclusive results.

Further observation is necessary on vicinism study for assessing natural crossing.

The lintlessness in L.L. Downy was found to be governed by an identical gene as lie in Pajb Fairy Lintless.

Manifestation of hybrid vigour was evident in four combinations for yield.

A high percentage of totad was observed in the sterile hybrid Co. 2 $\times$ *armourianum* and the sterility barrier is being investigated.

In the study on germplasm bank, the Russian types were found to be remarkably early.

In the manurial trials with N, P, K singly and in combination, it was found that nitrogen in combination with potash recorded the highest yield.

The trials on time of sowing under the Lower Bhavani Project conditions revealed that early sowings (last week of August) resulted in better growth and freedom from pests and diseases.

Encouraging results were obtained under the two breeding schemes financed by Indian Central Cotton Committee. The strain HIL 192 in the advanced stages of trial indicated promise of fulfilling the objective of the Extra Long Staple Cotton Scheme. One selection in the main strain trial under the Karunganni Scheme recorded significant improvement in all the three economic characters.

Transmission to ryots.—The new strain MCU. 3 is recommended for the unirrigated combodia tract also. Seeds of Moco were distributed for growing along field bunds, backyards, etc.—

Early sowing of cotton by the last week of August is recommended for the areas in the Lower Bhavani Project. The final stage was reached in the multiplication of the new strain and the

entire area of the seed farms at Coimbatore and Koilpatti was covered with the new strain, K6 and seeds will be distributed for general cultivation. The seeds of existing improved strains, MCU. 1, MCU. 2, P 216 F, K.2 and K.5 were distributed to be ryots, through the extension staff. K.2 and K.5 will be withdrawn from cultivation during the next season.

Economic gain to the ryots.—Evolution of a cosmopolitan strain for the irrigated and unirrigated winter combodia region will eliminate the evil effects of mixing inferior cottons with superior ones. The quality of the entire produce will be stepped up.

The utilisation of wild germplasm is expected to result in the evolution of strains resistant to pests and diseases combined with special attributes like fineness and strength. This will result in reducing the cost involved in preventive measures.

Maintenance of purity is aimed at in studies on marker gene and yicinium studies. The factors that contribute for germination and advance information on germination will help the ryot to secure uniform stand. Phenomenal increases in economic characters are aimed at in production of hybrid cotton. Recommendations of a suitable manurial schedule are envisaged in the programme of NPK trials.

Extension of area under cotton in the potential area of one lakh acres in the Bhavanisagar Project is handicapped by poor performance of American Cottons. Attempts have been made for evolving a suitable strain.

An economic gain of Rs. 40 per acre has been estimated by growing the new strain K6 (Pandyan). The new strain MCU. 3 would fetch an additional income of Rs. 56 per acre.

(F) Sugarcane.

Agronomy—Varietal experiments.—During the year under report, eight new Coimbatore varieties, viz., Co. 1309, Co. 1310, Co. 1311, Co. 1312, Co. 1313, Co. 1315, Co. 1316 and Co. 1321 and forty-two P and G selections from Coimbatore were under multiplication.

From the seedlings of 1957 series, only two varieties, viz., Co. 1178 and Co. 1221 were carried forward for preliminary yield trial. Twenty-four varieties of 1958 release and 86 varieties of 1959 release were planted in the second year and first year study plots respectively from which the following varieties were selected for trial in the early and late season.

Early series.—Co. 1234, Co. 1237, Co. 1255, Co. 1268, Co. 1279, Co. 1280, Co. 1295, Co. 1296, Co. 1299, Co. 1302, Co. 58, N.Co. 310, N.Co. 876, CP. 50/11 and B. 87172.

Late season.—Co. 1232, Co. 1279, Co. 1280, Co. 1285, Co. 1287, Co. 1289, Co. 1290, Co. 1296, Co. 1297, Co. 1299, Co. 1303, Co. 1308, Q. 58, N.Co. 310 and B. 37172.

During 1961-62, 24 varieties of 1959 release and eight varieties of 1960 release were planted in the study plot for the second year and first year of trial respectively.

In the preliminary varietal yield trial I series (early) none of the varieties proved superior to the standard Co. 658 in sugar per acre except Co. 1214. Co. 527 which was an early rich cane was found to be have recorded poor quality. Co. 1157 and Co. 849 were also found to be rich early canes.

In the second series Co. 1235 recorded the maximum yield (60.5 tons) and quality of 13.27 per cent C.C.S. followed by Co. 658. In this trial also, Co. 527 recorded poor quality. Co. 1254, Co. 1268 and Co. 1269 were found to be rich early canes.

Among eight varieties, viz., Co. 449, Co. 658, Co. 785, Co. 527, Co. 740, Co. 726 and Co. 997 and Co. 1001 studied for the third year in the main yield trial (early). Co. 740 recorded maximum yield. Though the existing standard Co. 527 was on par with Co. 740 and Co. 449 in respect of yield, the quality was lowest. Consistent with yield and quality Co. 658 was found to be the best. Though Co. 997 was a rich cane it was found to be a poor yielder.

In the adsali varietal experiment, of the varieties Co. 527, Co. 658, Co. 711, Co. 758, Co. 740, Co. 782, Co. 785, Co. 853, Co. 997 under study, variety Co. 853 recorded maximum yield of 62.9 tons per acre and 7.25 tons of sugar. Varieties Co. 658, Co. 740, Co. 785 were also found to be quality canes for adsali season. Variety Co. 658 recorded minimum fibre (12.2 per cent) and was satisfactory both in respect of yield and quality. Though Co. 997 was a quality cane it recorded lowest yield in adsali season. In respect of fibre, Co. 785 recorded maximum of 17.6 per cent.

Manurial experiments.—Among four inorganic fertiliser, viz., ammonium sulphate nitrate, urea, calcium ammonium nitrate, and ammonium sulphate tested on sugarcane, all fertilisers were found to be equally effective regarding yield and juice quality. The combined fertiliser containing nitrogen, phosphate and potash in the form of nitrophoska green and blue was compared with nitrogen alone as ammonium sulphate, and nitrogen with phosphate as ammonium and super along with 10 nitrogen and super alone. No yield or quality differences was observed for phosphate and potash applied separately or in combination. The treatment ammonium sulphate with super recorded maximum yield of 57.6 tons per acre and was on par with nitrophoska blue or green. In the adsali trial with five graded doses of nitrogen, viz., 200 lb. N, 250, 300, 350 and 400 lb. N per acre with three varieties, Co. 527, Co. 658, Co. 785, the maximum yield of 31.6 tons of cane was recorded by

Co. 658. The yield differences were not statistically significant either for major or minor treatments. No increased yield over 250 lb. N per acre was obtained. The quality in juice was slightly depressed over 300 lb. N per acre.

In the adsali split dose of application trial, 30 lb. N applied at planting did not record higher yield as compared to no basal manure application at planting.

Cultural trials.—In the propping experiment, the trash twist propping did not prevent lodging as compared to no propping. Hence not much yield differences was observed on the variety Co. 449, between treatments and there was also no difference in quality. The propping treatment recorded 50.1 tons of cane per acre as against 48.8 tons for no propping treatment. In the mulching trial, application of trash mulching in cane rows on 45th day was found to save about seven irrigations during summer period and also recorded more cane yield per acre. An acre yield of 46.05 tons was recorded for trash mulch treatment as compared to 42.25 tons for no trash mulch. The application of 2-4-D sodium salt and Pento-Chlorophanol, at 3 lb. and 2 gallons per acre in 100 gallons of water each, scorched the dicot weeds in the initial stages and complete control of weeds could not be obtained, as compared to trash mulching and normal method of control, viz., 3 weedings and 2 diggings.

In the Hawaiian method of cane cultivation involving planting in deep furrows of 18 inches depth and no earthing up, trashing, or propping as compared to normal method of cane cultivation, the yield and quality were found to be better in Hawaiian method for both main and special season. However, germination failure was found to be more during adsali season in Hawaiian method due to silting of furrows by soil from the top of ridges. Slight improvement in juice quality was noticed for hormone, spraying of 2-4-D sodium salt as pre-harvest spray 15 days before harvest.

Chemistry—(i) *Studies on nutrition of sugarcane.*—The experiment 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 two varieties Co. 419 and Co. 449 were studied.

The basal application of P_2O_5 and K_2O have no appreciable effect on germination. Even though the tillering was found to be greater in Co. 449, the population count in the month of October and at harvest was found to be almost same in both the varieties. The juice analysis showed that there is depression in juice quality with higher dose of nitrogen. The additional application of P_2O_5 and K_2O for the last three levels of nitrogen have no effect on juice quality. The variety Co. 449 recorded better juice quality than Co. 419 indicating early maturity.

The sheath moisture of Co. 419 was found to be consistently higher than Co. 449. In January, Co. 449 has recorded an average of about 76 per cent moisture while Co. 419 about 80 per cent showing their different in maturity behaviour. It is interesting to note that juice quality is higher when the sheath moisture is less.

The effect of higher doses of nitrogen in both the varieties are the same and there are no significant interactions. Even though statistically non-significant, the P_2O_5 and K_2O applied plots, have recorded higher yield of cane and sugar per acre for the last three levels of nitrogen. The maximum yield of 63.3 tons per acre was obtained for the variety Co. 419 from 350 lb. NPK per acre plot and 54.5 tons per acre was the maximum yield for the variety Co. 449 from 250 lb. NPK per acre plot. The C.C.S. in the tons per acre was found to be higher at 150 lb. per acre for Co. 419 and Co. 449 thereby showing that juice quality is depressed at higher levels of nitrogen.

(ii) *Foliar spraying of nitrogenous fertilisers.*—To test the efficiency of Foliar spraying of nitrogenous fertilisers to sugarcane as compared to soil applications and to determine the degree to which foliar spraying can replace soil applications, an experiment with the treatments consisting of four major treatments, viz., soil applications of 0, 25, 50 and 75 lb. of nitrogen per acre and six minor, viz., foliar applications of 0, 10, 20, 40 and 50 lb. N per acre was laid out.

The results indicate that foliar application of 20 lb. N per acre for soil applications of 0 and 25 lb. N per acre and 40 lb. N foliar application for soil applications of 50 and 75 lb. per acre have increased the juice quality. There is a corresponding increase in yield of cane and sugar per acre noticed in soil applications of 0, 25, 50 and 75 lb. N with combined foliar spraying of 10 lb. N. The soil application of 75 lb. N per acre combined with foliar spraying of 10 lb. N per acre produced a maximum yield of 65 tons per acre while soil application of 50 lb. N per acre combined with foliar spraying of 10 lb. N gave a maximum sugar of 7.77 tons per acre.

(iii) *Graded doses of nitrogen.*—The observation trial was laid out to study the influence of higher doses of nitrogen on yield and quality of juice. The two varieties Co. 419 and Co. 449 were studied and the treatments were 0 lb. N to 500 lb. N per acre with an increase of 50 lb. N per acre at each level. The yield data showed that the maximum C.C.S. in tons per acre was obtained in 100 lb. N per acre in Co. 419 and 200 lb. N per acre in Co. 449. The maximum yield of cane was recorded in 400 lb. N per acre in both the varieties. The yield of cane increased with N dose but showed no marked difference in yield at higher levels. The

glucose percentage of juice was found to be higher in canes manured with higher doses of N. The variety Co. 419 recorded less Glucose percentage than Co. 449.

(iv) *Preliminary studies on crop logging.*—The leaf nitrogen was determined from the nutrition experiment. The results indicated that there was gradual fall in leaf nitrogen with age for non-nitrogen treatment while plots received 150 lb. N per acre and above showed a rise in leaf nitrogen from fourth month to fifth month and a steep fall thereafter. The average leaf nitrogen for seven months showed that the nitrogen content in the leaves tends to increase with addition of nitrogen to soil. The phosphate and potash application at 150 lb., 250 lb. and 350 lb. N per acre improved the leaf nitrogen content to some extent.

(v) *Analytical work.*—More than two thousand seven hundred samples of sugarcane juice were analysed during the year. These were drawn from different experiments relating to agronomy, chemistry, entomology and mycology trials. In addition, studies on sheath moisture and estimation of leaf nitrogen were undertaken.

Scheme for studies of physical and chemical criteria of gur leading to the formulation of basis of gur grades.—The scheme was sponsored by the Indian Central Sugarcane Committee and is functioning in Madras State at the Central Sugarcane Research Station, Cuddalore, from June 1959 onwards.

Gur samples were collected for both special and main seasons from Coimbatore, Salem, North Arcot, South Arcot and Tiruchirappalli districts. The samples collected from these centres were analysed regularly at monthly intervals for their physical properties and chemical constituents.

The results indicated that there was not much variation in the gur produced in the different centres, in respect of chemical factors to determine quality. It was observed that the gradings were made in the markets on the basis of colour and hardness alone. On a combined assessment of quality factors based on chemical composition of gur, almost all the gur produced in Madras State conform to the medium grade. In general, gur produced in Madras State have low values for pore space and therefore lack openness in texture.

Entomology—Studies on the three sugarcane borers.—The early shoot borer (*Ghilotraca infuscatellus* snell).

The top borer (*Scirpophaga nivella* FB) and the internode borer (*Proceras indious* K) were in progress.

Observations made on the varietal resistance and extent of damage caused by the different borers showed the incidence of the early shoot borer perceptibly low in the variety Co. 658 followed by

Co. 449 and Co. 785, the percentage of incidence being 4.8, 5.8 and 6.8 respectively. Among the sixty varieties raised for agronomic studies in the Agronomy Section, the incidence of the early shoot-borer was observed to be very low in the varieties Co. 658, Co. 997 and Co. 1239. The top borer incidence ranged from 10 to 20 per cent while the occurrence of the Internode-borer was uniformly high in all the varieties. In the variety Co. 997 the quality of the juice was affected to a very high degree due to Top borer attack.

There was four broods of the top borer during the cropping season 1960-61 commencing from the first week of August 1960 and continued till the end of May 1961. Of the four broods, the third one was observed to be severe and lasted for a period of two months.

A randomised and replicated insecticidal trial was laid out with the formulations comprising of soil application of BHC emulsion concentrate at 5 lb. per acre and sprays of DDT 0.25 per cent, BHC 0.5 per cent, Endrin 0.1 per cent, Aldrin 0.1 per cent, Dieldrin 0.1 per cent, Folidol 0.05 per cent and Ryania 0.5 per cent. The data gathered were statistically analysed and the spray formulations of Endrin 0.1 per cent and Aldrin 0.1 per cent as well as the soil application of BHC emulsion concentrate at the rate of 5 lb. of the chemical per acre were found superior over other treatments which were on a par with the control (No treatment).

Studies on the natural enemies were also pursued. The egg parasite (*Teleomus benefians* Z.) of the Top borer, the larval parasite *Blacus Zohuthierii* ferr., *Rhaconotus scirpophaga* B., *Rosch-nensis* L., *Stenobracon deesae* cam., *S. nodicollis* B. on Top borer and *Apanteles flavipennis* Cam., on Inter-node borer, were recorded during the period under review.

Observations on the minor pests of sugarcane such as the cane fly (*Pyrilla perpusilla* Ulk), the white fly (*Aleurelobus barodensis* Mask), the mealy bug (*Saccharicoccus sacchari* Green) were continued but none of them was noticed serious proportions during the cropping season. The presence of the root-knot Helworm (*Meloidogyne javanica*) was recorded in the varieties Co. 419, Co. 658, Co. 1001 and Co. 740 but not in a serious form.

Mycology.—The following sixteen varieties were tested for their resistance to smut: Co. 419, Co. 449, Co. 467, Co. 527, Co. 658, Co. 711, Co. 726, Co. 740, Co. 758, Co. 853, Co. 997, Co. 1001, Co. 1202, Co. 1213, and Co. 1217. Except Co. 527 and Co. 785 smut was recorded in all the other varieties. Varieties which showed less than 5 per cent are Co. 449, Co. 658, Co. 997, Co. 1001 and Co. 1202. The incidence was between 5 and 10 per cent on Co. 726 and Co. 467. It was more than 10 per cent on the remaining varieties. The trial has been repeated with 20 varieties during

the current year. The experiment was in progress. In the smut ratoon trial no smut was recorded in the plant crop. The crop was harvested and ratooned. The observations were in progress.

An experiment to test the efficacy of the following treatments against sett rot was conducted: 1. Mercurine 1 oz. in 5 gallons of water. 2. Hexasan 8 oz. in 5 gallons. 3. Cerenox. 4. Tiram. 5. Hexasan. 6. Mercurine. 7. Aretan (all 1 oz. on 2½ gallons of water). 8. Bordeaux mixture 1 per cent. 9. Control I. Dipping the setts in spore suspension of the fungicides 10. Control II. No treatment. Germination counts were taken at the end of the fifth week. Although the treatments were not found to be statistically significant, increase of germination by 10 per cent over control was noticed in Thiram and Aretan treated plots. The following varieties of standing canes Co. 419, Co. 449, Co. 527, Co. 658, Co. 740, Co. 785 and Co. 1001 were tested for their resistance of Pine apple disease, *Ceratocystis paradoxa*, by standard plug method. Maximum infection was noticed on Co. 1001, Co. 740, Co. 527 and Co. 419. Juice analysis showed loss in juice quality due to the disease in all the varieties.

The following 12 varieties Co. 1236, Co. 1238, Co. 1240, Co. 1248, Co. 1244, Co. 1246, Co. 1248, Co. 1267, Co. 1268, Co. 1272, GP. 30/111 and 36/101 were under observation for natural occurrence of rust. Stray incidence was observed on Co. 1248 only in November. There was no further spread.

Nematode fungus complex studies have been taken up during the current year. Nematodes were collected from soil samples of the cane fields in the farm. From the same soil *Pythium* sp was also isolated. Nematodes were multiplied in oats agar medium. The pathogenicity of Nematodes and fungus both in combination as well as separately was being conducted.

Investigations on drying of leaves and tops in some varieties in Nellikuppam area is in progress. From the root of Co. 758 showing severe drying of leaves *Rhizoctonia* sp has been isolated. The fungus is being tested for its pathogenicity.

Practical results.—Variety Co. 658 has been found to be a rich early cane in Nellikuppam tract and has replaced Co. 527 variety which is showing signs of decline. The variety Co. 658 has also been found to be a suitable variety for adsali season in Nellikuppam zone. About 1,000 acres will be brought under cultivation during adsali season. Two hundred and fifty lb. nitrogen was found to be optimum both for adsali and eksali crops. By applying cane trash mulch between cane rows, about 7 to 8 irrigations can be saved for sugarcane crop and mulching is also helpful in suppressing weed growth. By adoption of above methods, it is expected that growers will get a net gain of Rs. 25.0 lakhs. The results obtained,

the acreage under improvement and net gain to the cultivator due to additional production anticipated and saving in cost of cultivation are given below:—

Results obtained.	Acreage.	Net gain to the cultivator.
(1)	(2)	(3)
(1) Co. 658 has been found to be a suitable adsali cane.	1,000 acres	At Rs. 400 per acre, as additional increase over Eksali Crop, the growers will get Rs. 4 lakhs as additional income.
(2) 250 lb. nitrogen was found optimum for adsali crop.	About 1,000 acres will be benefited. There will a saving of Rs. 200 per acre in the manure bill as at present 350 lb. Nare applied for adsali crop.	There will be a net saving of Rs. 2 lakhs to the growers.
(3) Application of trash mulch was found useful in reducing about 7 irrigations to crop without affecting yield or quality.	About 400 acres will be benefited and result in saving of Rs. 40 per acre towards irrigation expenses.	There will be a saving of Rs. 1.6 lakhs to the growers.
(4) 250 lb. N was found optimum for eksali crop.	By adequate manuring in ten thousand acres and by avoiding over manuring in 5,000 acres, an additional yield of 3 tons per acre can be obtained in about 10,000 acres. Rs. 100 per acre can be saved in avoiding over manuring in about 5,000 acres.	There will be a gain to the extent of 17.0 lakhs to the growers.

(G) Horticultural Crops.

F. Fruits (a) Grapes.—The Anab-E-Shahi grape variety continued to maintain its superior yield performance over other varieties at the College Orchard recording an estimated yield of over 52,000 lb. in one crop alone in the summer season of 1961. Among the three systems of training, viz., head, cordon and pandal, the pandal system was found to be conducive for maximum yield in the Anab-E-Shahi variety. In the studies conducted on monthly pruning of vines, in Bangalore Blue variety the data gathered indicated the possibility of securing crops throughout the year by staggering the pruning operation. Preliminary observations on the water requirement of grapes showed that the grapes can withstand water deficits in the upper layers of the soil to an appreciable extent.

At the Fruit Research Station, Periakulam, head system of training was found to be superior to double horizontal cordon and pandal systems for the Pachudraksha variety. Observational trials on the thinning of berries indicated that although there were no marked differences in the yield of the crop from the different treatments, there was better development of berry size and colour in the bunches in which 25 to 30 per cent of the berries had been thinned.

(b) *Citrus*.—In the rootstock trial at Kallar, two grafts of Wynaad mandarin on sweet lime, two grafts of Kallar mandarin on Jamberi and one graft on Gajanimma came to bearing and the quality was found to be poor in all the grafts. In the citrus collection at Fruit Research Station, Periakulam, Italian lemon came to flowering earlier than other lemons varieties. The percentage of fruit set was found to be the highest in Malta lemon.

(c) *Banana*.—An attempt to fix the origin of cultivated varieties by means of characters which could be measured quantitatively, was initiated during the year. Studies made on nine hybrid progenies of established commercial varieties revealed that all of them were very much inferior to their female parents. No differences in yield were observed between corms and bits of corms as planting material in varieties Mauritius and Rasthali indicating that both can be used for planting. There were also no differences between manuring in trenches and the basin system of manuring in Monthan and Poovan varieties. Irrigating the crop in perennial area did not lead to increased yields in Monthan while in the case of Poovan, the higher yields obtained were not commensurate with the additional cost involved in irrigation. A spacing of 9' x 9' was found to lead to higher yields than wider spacings in Monthan and Rasthali varieties. In the rotation trial in wetlands, growing two crops of banana followed by sugarcane led to increase monetary returns when compared to growing of two crops of banana followed by green manure and paddy.

(d) *Mango*.—At Fruit Research Station, Periakulam, studies made on the blossom biology in mango showed that among the varieties, the average percentage of perfect flowers was highest in Bangalore (5.40) and the lowest in Baneshan (4.45). At the Fruit Research Station, Cape Comorin, it was found that the variety Neelam recorded a maximum of 95 per cent of perfect flowers while the lowest, viz., 1 per cent was recorded in the variety Kalkachi. The percentage of perfect flowers in a variety was found to vary from month to month. For production of blossoms it was observed that the shoots should have attained more maturity than for production of flush.

(e) *Hill Fruits*.—In apples, the Merton root stocks 778 and 779 continued to maintain their superiority over other root stocks in regard to vigour and yield. The Malling Merton stocks MM 110, MM. 112 and MM. 113 were found to be highly resistant to woolly aphis pest. In plums, the common peach rootstock continued to impart better tree vigour compared to its own seedling stock. Spraying of Sandolin 'A' generally resulted in earlier bud-break and increased yields in plums as in the past. In Gaviota variety, the sprayed trees broke dormancy by about eight days earlier and gave increased yield at 113.6 per cent over the control trees. Delayings pruning beyond January was found to be ineffective in the Shire variety. Eight months old peach seedlings continued to

maintain their superiority over older stocks for the propagation of peach both in regard to vigour as well as yield. In arching of persimmon on *Diospyros lotus* in the month of December gave 75 per cent take. In cherimoyer, seedlings recorded better growth and yield than grafts.

A scheme for the improvement of apples in Kodaikanal partly financed by the Indian Council of Agricultural Research came into operation on 16th March 1961. Arrangements were under way to initiate the several trials. In the survey of apple growing areas conducted in Kodaikanal and Coonoor, seven apple selections were made for further study.

Jack.—For jack, Rudrakshi was found to be superior to its own stock in respect of yield of the grafted trees. A graft on Rudrakshi recorded an yield of 581 lb. as against an average of 355 lb. obtained in grafts on jack.

Annona.—Bull's heart continued to maintain its merit as the optimum rootstock for custard apple.

Papaya.—Improvement of papaya through inbreeding to evolve superior strains was in progress. A selection from the Washington variety was nearing the desired extent of purity for being released as a new strain. Seed multiplication and distribution was under way in C.O.I. papaya. Studies on papain extraction were taken up and preliminary data were gathered on the best varieties and best stage in fruit development for maximum papain yields.

Vegetables.—A research scheme for perennial vegetables (drumstick, chow chow, Coccinia, etc.) was newly initiated during the year. Selections in the crops enjoying regional popularity were made and brought under trial.

One type of tomato (H.128) and two in brinjal (H.128 and H.129) and two in bhendi (A.E. 8 and A.E. 9) were isolated as superior during the period. In brinjal and bhendi, high yielding hybrid selections were isolated in hybrid vigour studies. Seed multiplication was in progress with promising selections of gourds and radish.

3. *Tuber crops*.—*Potato*.—In a trial to determine the optimum fertiliser requirements of a few popular varieties it was found that the yields were not increased by increasing the doses of N, P and K. In the studies made to assess the effect of various inward slopes on the yield and incidence of brown rot disease, yields were greater in terraces with 12 inches and 9 inches slopes while the incidence of the disease was found to be the maximum in terraces with six inches slope. It was found possible to inter-crop potato with French bean without any reduction in the yield of potato.

This combination was better than growing potatoes with cabbage. In the tillage experiment, the results were in favour of cultivation of land to a depth of six inches using victory plough. The use of seed tubers from mosaic and leaf-roll virus infested plants was found to reduce the yield in potatoes considerably.

4. *Species and beverage crops*.—In clove, current seasons sucker shoots gave better success as scion material than terminal shoots. In nutmeg, grafts of *Myristica Fragrans* on its own stock showed precocity.

In Cacao, it was found possible to propagate the crop vegetatively by means of semi-hard wood stem cuttings with four or five leaves after treating them with a mixture of Indole Dutyrice acid and naphthalene acetic acid at 5,000 ppm and planting them in saw dust medium. In regard to curing of Cacao beans, charges with 56 pounds in sweating boxes were conducive for complete fermentation compared to charges of lesser quantity. A duration of four to five days was found essential for proper curing.

5. *Ornamental gardening*.—Five new kinds of ornamental plants, viz., *Anthemis nebilis*, *Valeriana officinalis*, *Chicorium intybus*, *Heliconia braziliensis*, *Passiflora caerulea* were newly introduced in the Government Botanic Gardens, Ooty. At Sim's Park, Coonoor, *Ferula tingitana*, *Sansur a lappas chocory* and *Quercus suber* were added to the existing collection. In seed viability studies with seeds of trees and annuals, seeds of *Antirrhinum* and *Dianthus* among annuals were found to remain viable for over nine months while in the case of tree seeds, seeds of *Acacia Decurrons* recorded the maximum longevity of nine months. Growth and flowering features of six kinds of orchids and three kinds of annuals were studied. A comprehensive collection of thirty varieties and kinds of Begonias and twenty-four of Amaryllis was built up at Ooty. Twenty-one varieties of giant decorative Dhalias were isolated as promising for multiplication and distribution at Sim's Park, Coonoor.

Under the Indian Council of Agricultural Research Scheme, for the maintenance and propagation of imported plants, a number of outstanding selections in annuals, bulbous plants and other ornamental plants were made and put under study.

6. *Miscellaneous fruits and other crops including new introductions*.—At the Fruit Research Station, Periakulam, among the different guava varieties, the variety Babatia recorded the maximum fruit set while the lowest was in seedless variety. In fig, variety Brown Turkey registered the minimum duration of 52 days between flowering and fruit set while a maximum of 68 days was found necessary in Kallhatti variety. At Coonoor several new introductions including a chicory variety from Holland, Olive from Italy,

Chinese gooseberry from Australia, Malling Merton rootstocks in apple, etc., showed promise. At Kallar, white sapota, Meyer lemon, *Kauwolfia Serpentina*, Tahiti lime and Tolu were successful. At Coimbatore, the performance of white sapota, Meyer lemon and West Indian Cherry continued to be satisfactory.

Scheme for training of gardeners.—The fourth course of training of gardeners at the Agricultural College and Research Institute, Coimbatore, for a period of six months was initiated on 1st July 1960, under the scheme sanctioned in G.O. Ms. No. 1979, Food and Agriculture, dated 29th June 1957, 30 trainees against 50 provided for. The trainees were given practical training with theoretical background instructions for a total of 404 hours 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, and grading, layout of ornamental gardens, maintenance of nurseries, identification of pests and diseases including their prevention and control measures, etc. On the basis of the practical tests conducted to evaluate their progress 28 trainees were awarded the certificate of competency in practical horticulture.

Scheme for the establishment of Model Orchard-cum-Nurseries in Madras State—(i) *Model Orchard-cum-Nursery*.—Thimmapuram.—During the period 20,192 fruit and other economic plants, 318 ornamental plants and 14,950 green manure plants were distributed. The performance of the orchard trees especially of Co. 1 papaya was satisfactory.

(ii) *Model Orchard-cum-Nursery*, Periakulam.—During the period, a total of 17,578 fruit plants and 4,500 green manure plants were distributed to the growers. The growth and progress of the orchard trees were in general satisfactory.

(iii) *Model Orchard-cum-Nursery*, Courtallam.—The centre was inaugurated on 9th February 1960 only. The nursery activities were initiated. Soil conservation work was in progress and an area of 12.50 acres was terraced. Arrangements were under way to layout the orchard plots.

(iv) *Model Orchard-cum-Nursery*, Kodumal.—The centre commenced functioning on 9th March 1961 with the posting of the Assistant. Formal inauguration of the centre was held on 30th April 1961. Arrangements were made for initiating the nursery activities, terracing the lands, and for laying out the orchard plots.

(v) *Model Orchard-cum-Nursery*, Athur, Chingleput district.—The centre was started on 31st January 1961. Arrangements were underway to initiate the nursery activities and to layout the orchard plots.

7. Vegetable Seed Production Units at Model Orchard-cum Nurseries.—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. 1893, Food and Agriculture, dated 25th March 1959. The scheme awaits implementation at the Model Orchard, Kodaikanal, while the work in other centres was commenced during 1959-60. During the year under report, a total quantity of 985 lb. of vegetable seeds were distributed from the above centres. The additional production of vegetable as a result of this distribution is estimated at about 6,250 tons.

B. Research schemes under the Second Five-Year Plan.

The following research schemes were reported under the Second Five-Year Plan:—

(i) Scheme for intensification of research on important fruits in the Country, Periakulam (Fruit Research Station, Periakulam).

(ii) Scheme for research to improve and stabilize off season production of mangoes at Kanyakumari (Fruit Research Station, Kanyakumari).

(iii) Scheme for the establishment of a Central Banana Research Station, Aduthurai.

Supply of plants.—A total of 379,433 plants and 22,874 lb. of seeds were distributed during the period under report from the different nurseries and fruit stations in the State.

Practical utility of the year's achievements on Horticultural Research.—A brief account of the achievements in research during 1960-61 and their practical utility in the improvements of the several horticultural crops of the State are furnished below:—

Fruits.—The Anab-E-Shahi grape variety continued to maintain its superiority over the other varieties at Coimbatore both in regard to yield as well as fruit quality. In the studies on monthly pruning vines in Bangalore Blue variety it was found that cropping can be secured throughout the year by staggering the pruning operation. Under Periakulam conditions, the system of training vines to the head system was found to be favourable for maximum yields in Pachadraksha variety. Large scale multiplication and distribution of seeds of the improved papaya variety Co. 1 were continued. Studies made on the method of propagation of banana showed that for propagation of banana either entire corms or bits can be used. No differences in yield were observed between trench and basin systems of manuring in bananas. Irrigating the perennial Poovan banana was found to be an uneconomical practice while in the case of Monthan, irrigation failed to

give and response. For monthan and rasthali varieties, a closer spacing of 9 feet by 9 feet was found favourable for maximum yields. Growing two crops of banana followed by sugarcane was found to be a better rotation practice for increased monetary returns than raising two crops of banana followed by green manure and paddy.

Morton 778 and 779 for apples and common peach seedling for plum continued to maintain their merit as the best rootstocks. Dormant sprays of Sndelin 'A' in shybearing plum varieties continued to induce earlier bud break and increased yields. The results gathered under peach rootstock trial confirmed the merit of eight month old common peach seedlings as the most suitable for propagation of peach. In Cherimeyar, seedling registered better vigour and yield compared to grafts.

Vegetables and tuber crops.—The promising types of gourds, radish, sweet potato and tapioca were under multiplication and distribution. One type of tomato (N. 123) two brinjal (H. 129 and H. 128) and two in bhendi (A.H.S. and A.E. 9.) were found to be superior. In potato, cultivation to a depth of six inches using victory plough and forming terraces with inward slopes of 9 inches and 12 inches were found to promote yields. Potato and french bean proved to be a better combination for mixed cropping than raising the crop with cabbage. The use of mosaic and leaf roll virus infested tubers was found to reduce the yield of potatoes considerably.

Spices and beverage crops.—Current season's sucker sheets used as scion continued to record better establishment of grafts than with terminal sheets in clove. Rooting of stem cuttings was found feasible in cases with the aid of mixture of Indole butyric acid and naphthalene acetic acid at 5,000 p.p.m. and by placing the cuttings in saw dust medium.

Ornamental gardening.—Several new kinds of ornamental plants were successfully introduced and established. Studies on the viability of seeds of different kinds of trees and annuals were carried out.

Plant and seed supply.—During the year, 379,433 numbers of elite plant material of fruit trees and vegetables, 104,111 lb. of potato seed tubers, 18,7685 lb. of seeds of other horticultural and economic crops were distributed from the various centres. Distribution of vegetable seeds amounted to over 9,00 lb. from all horticultural stations. It is estimated that an area, of nearly 2,200 acres would have been covered by those improved seed and plant material. An area of about 7,056 acres is estimated to have been covered by various improved cultural practice recommended under the different research centres and schemes. The additional production of horticultural crops using these plants, seeds and by

adopting improved practice, etc., is estimated at 23,140 tons valued at 23.14 lakhs.

Whether the results of research have been transmitted to ryots.—The results of research were transmitted to the growers through enquiries in person and by post, exhibitions, training, publicity and propaganda and through distribution of improved seeds and plants to growers.

A total of 16,300 enquiries on plant supplies and improved horticultural practice were received and attended to. Four hundred and seventy private orchards and private gardens were visited by the staff and the growers were advised on proved vaimprities and practices. The achievements in horticultural research were displayed in ten major exhibitions and sixty local exhibitions within the State and outside. The results were also transmitted to growers during the Annual farmers' Day gatherings. Twenty eight young farmers were given intensive practical training in all aspects of horticulture over a period of six months under the scheme for training of gardeners. Thirty-nine lectures and demonstrations were given at village leaders camps and Gramasevak centres. A total of twenty-four scientific and popular articles on achievements in horticultural research were either published or submitted for publication. The results were also published through posters and charts.

Economic gain to the ryots by adopting the results.—The Anab-E-Shahi grape variety has established itself as a promising grape variety for the Madras State. It is estimated that at least 40 acres would have been brought under this superior variety of grape during the year which would result in an output of about 280 tons of fruits annually valued at Rs. 1.40 lakhs. An area of at least 18 acres is estimated to have been brought under the promising strain of Co. 1 papaya which would yield an additional production of 54 tons of fruits valued at Rs. 6,450. An additional production of 17,537.5 tons valued at about Rs. 17.54 lakhs is anticipated by supply of improved plant material and adoption of improved horticultural practices in banana. In potato, increased production through distribution of improved disease-free seed tubers is estimated at 490 tons. The successful vegetative propagation methods evolved in fruits, spices, etc., would enable the growers to stock their orchards and plantations with plant material from selected and superior trees which in turn would lead to increased profits.

The improved seed and plant material distributed during the year as well as the improved horticultural practices advocated are expected to cover an area of 9,256 acres. The additional productions of horticultural crops during the year is estimated at 23,140 tons valued at Rs. 23,14,000.

14. AGRICULTURAL RESEARCH STATION.

(1) Agricultural Research Station, Aduthurai.

Season and Rainfall.—The Mettur Reservoir was opened on 16th June 1960 and water reached the Agricultural Research Station, Aduthurai on 22nd June 1960. The transplantation of *kuruvai* was taken up on 3rd July 1960. During the year under report there was a total rainfall of 60.35 inches as against 31.57 inches recorded during the previous year and against a "Ten Year Average" of 39.62 inches. The rainfall was above normal in the hot weather period, South West Monsoon and North East Monsoon periods resulting in normal yields of *kuruvai* and *thalai* crops. However the *samba* crops was affected to some extent by *sooty* disease and field rats and the yields were slightly below normal.

Paddy—(a) Seed Distribution.—During the period under report a total quantity of 44,254 kg. of nucleus seeds of the improved strains of paddy was distributed to the Agricultural Extension Staff for multiplication in Primary and State Seed Farms. *(b) Breeding.*—Three promising cultures of *mattakuruvai* were compared for yield against the standard in the *kuruvai* season. Two cultures, viz., Nos. 2025 and 2028 recorded significantly higher yields than the control with 11.4 per cent increased yield. Four cultures viz., Nos. 2030, 2031, 2032, 2033 isolated from the progenies of the cross between ADT 16 and GEB 24 for the evolution of non-shattering fine riced grains were compared for yield against ADT 16 in the *kuruvai* season. Culture No. 2032 only was on a par with ADT 16 in grain yield besides being non-shattering in habit and earlier in duration by a week. Sixteen cultures selected from the progenies of the cross between Japonica and Indica were grouped into four series and compared for yield with their respective standards. All the four cultures in series III recorded higher yields than the standard. In the other groups none was superior to the standard. Out of 146 single plants grown and studied, 109 were selected for further study. In addition, nine homozygous lots from the crosses were fixed up for trial during the next *kuruvai* season. For the evolution of short duration strains possessing stiff straw character, twelve cultures were examined in three series and all the cultures in series I and II were retained for further study based on their economic performance. Series No. III was rejected as the yields were very poor. Seventy-three single plants were carried forward for further study. Six Cuttack varieties received from the paddy specialist, Gopalpur, were tested for yield with A.D.T. 9 and ADT 16 as standards during this year also. All the Cuttack varieties recorded significantly higher yields than the standards.

(c) *Manurial Experiments.*—The manurial experiment to determine the comparative efficacies of application of green manures, 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 this year in both the *kuruvai* and *thaladi* seasons. In *kuruvai* season, application of Farm Yard 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. To evaluate the response of different strains to higher doses of manures, a manurial experiments was repeated during this year on the same lines as in the previous years. There was no response in any of the strains tested in the experiment to higher doses of manures, namely, 60 pounds of Nitrogen and as Ammonium Sulphate plus 80 pounds of Potash as Sulphate of Potash over a basal dressing of 5,000 pounds of green leaf and 150 pounds of Super Phosphate per acre. An experiment to find out the effect of applying Ammonium Sulphate in fractional doses instead of in a single dose was repeated during this year in all the three seasons and the results indicated that there is no difference in yield between the methods of applying Ammonium Sulphate in a single dose and in fractional doses. To assess the effect and optimum time of application of the two Nitrogenous fertilisers i.e. (i) Ammonium Sulphate and (ii) Urea for the short duration crop (100 days duration) an experiment was laid out during this year with the following treatments.

(a) Varieties—ADT. 8 and ADT. 9.

(b) Fertilisers—80 pounds of nitrogen over a basal dressing of 5,000 pounds of green manure and 150 pounds of Super Phosphate.

1. All Nitrogen at Planting.

2. Half at planting and half at 30 days after planting.

3. All Nitrogen at 30 days after planting.

No significant difference in yield was noticed either between the varieties or between the treatments.

(d) *Cultural Trials.*—In order to find out the effect of pre-soaking paddy seeds in different strengths of Sodium Bicarbonate solution for 48 hours on the yield, an experiment was laid out with the following treatments both in *kuruvai* and *samba* seasons.

(1) Control.

(2) Seeds pre-soaked in 2.8 per cent of Sodium Bicarbonate solution for 48 hours.

(3) Seeds pre-soaked in 4.8 per cent for 48 hours.

(4) Seeds pre-soaked in 0.8 per cent for 48 hours.

(5) Seeds pre-soaked in 8.8 per cent for 48 hours.

No increased yield was obtained in any of the treatments.

(e) *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 the compiled data sent to the Director of Agricultural Meteorology, Poona-5.

Green Manure Crops.—From the pure crop of *Sesbania* grown in Rice Fallows and in *Gliricidia* plants grown on channel bunds, a total quantity of 159 Metric tons of green leaf was obtained and utilised for manuring the paddy fields. From the *Gliricidia* plants maintained along the main paths, 60 kgs. of seeds was collected. This station has attained self-sufficiency with regard to green manure requirements.

Pulses.—The pure line selection work for the evolution of high yielding strains of wet land Blackgram and Greengram was continued during this year. Three cultures of Blackgram and five cultures of Greengram which gave higher yields during last year were repeated during this year also. In addition, 5.93 acres were grown with Blackgram as a catch crop in rice fallows and an average acre yield of 148 Kg. was obtained. A total area of 200 acres was grown with Greengram culture No. 19 and an average acre yield of 177 kg. was obtained.

Fruit plants.—A total number of 679 fruit plants comprising of Acid lime, Malta lemon, Citron Hawaii, Pummello, Singapore jack and Mango grafts were sold to ryots. A total quantity of 1,180 kg. of fruits consisting of Mangoes, Malta lemons and Pummello were harvested and sold.

Coconuts.—From 161 Coconut trees that were bearing, 8,495 nuts were harvested and sold. Two hundred and thirty coconut seedlings were raised in nurseries and sold to the public.

Livestock.—From six sindhi cows that were in milk, a total quantity of 8,468 lb. of milk was obtained and disposed off. The Scindhi breeding bull maintained at this station for stud purposes, performed a total number of 60 services during the period under report. Eight and a half pairs of work animals were maintained at this station.

Agriculture.—Ten bee colonies were maintained at the station and a total quantity of 11.87 kg. of honey was extracted and sold.

Miscellaneous.—(a) *Vanamahotsava.*—A large number of fruit plants and green manure seedlings were supplied to the Agricultural Extension Staff during the "Vanamahotsava Week" for large scale planting.

(b) *Inauguration of the Seed Cleaning and Processing Demonstration in Thanjavur District.*—The Paddy Seed Cleaning and Processing Demonstration with the equipments received from the Rockefeller and Ford Foundations, New Delhi, was inaugurated at this

station and was attended by Dr. Johnson of Ford Foundation and other delegates from all over the country.

(2) *Agricultural Research Station, Pattukkottai.*

Season.—The total rainfall recorded during the year was 41.51 inches in 52 rainy days as against 42.68 inches in 61 rainy days in 1959-60 and 40.71 inches in 55.3 rainy days, the average of the past ten years. The rains in South-west monsoon were more than in 1959-60 and the average of the past ten years. The rain recorded in North-east monsoon was more than in 1959-60 and also the ten years' average; the rain in the hot weather period was less than in 1959-60 and also the past ten years' average. The distribution of rainfall were normal on the whole during this year.

Field Operations.—The water in the Cauvery Mettur Project canal (Rajamadam branch canal) was received on 28th June 1960 and was stopped on 28th February 1961. Kuruwai sowings were started on 14th May 1961 well in advance with the help of water in the farm wells. The sowings of samba and thaladi nurseries were commenced on 2nd August 1960 and 22nd August 1960, respectively. The kuruwai, samba and thaladi plantings were commenced on 29th June 1960, 2nd September 1960 and 25th September 1960, respectively. 14.74 acres were under kuruwai paddy, 9.82 acres under samba, 16.18 acres under thaladi and 3.68 under other crops.

1. *Evolution of high yielding strains*—(i) *Pure line selection.*

—1. *Mattamkuruwai in kuruwai season.*—Nine selections were tried in this yield trial during this year and four of them gave increased yield over the standard, the percentage of increase ranging from 7 to 12. These four selections only were retained for further trial during 1961-62.

2. *Kattavellai, Kodaivellai and Kaivarisamba in Samba Season.*—Two selections in Kattavellai and two in Kodaivellai and three in kaivari samba were put under yield tests with their respective standards. The yield differences in the case of Kattavellai and Kodaivellai selections, were not significant even though the Kodaivellai selections recorded slight increase in yield over the standard. But the results in Kaivarisamba selections were significant and all the three selections gave better yields than the standard.

(ii) *Improvement by mass selection.*—As a result of the survey conducted in this tract, it was seen that a number of important varieties exist in this area, but not extensive enough to warrant a full fledged pure line selection work in them. Ten selections in the minor varieties namely, Alagiavanam, Kattai Kumbalai, Kodaivalai, Peria Seenganni, Seria Seenganni and Vellai Kodaivalai were studied during the samba season for mass selection and purification. The seed were collected and retained for further work during 1961-62.

(iii) *Improvement by hybridisation.*—1. *ADT. 3 × CH. 9 progenies.*—39 progenies were put under preliminary yield trial in four groups with three replications. The study will be continued during 1961-62 also to get conclusive results by inducing lodging by heavy manuring.

2. *ADT. 15 × ASD. 1 progenies.*—Three selections were again compared with ADT. 15 in yield trial. Selection 1556 maintained its superiority with an increase of 12 per cent. followed by ADT. 15 the standard. The other two selections recorded less yields than ADT. 15 and all these three were having duration than ADT. 15.

(iv) *Introduction.*—1. *Trial of Chinese varieties in Kuruwai season.*—Six Chinese varieties were compared with ADT. 20 and ADT. 8 for yield under both heavy and light manuring conditions. Only Ch. 45 and Ch. 2 gave better yields than ADT. 8 and ADT. 20, but they were not shorter in duration than ADT. 8 or ADT. 20. The trial is to be discontinued in the year 1961-62.

2. *Inter strain yield trial in Kuruwai season.*—Eighteen Kuruwai and kar duration strains were compared in two groups, both under normal and heavy manuring conditions. In the kar group ADT. 9 recorded the highest yield under normal manuring conditions and S. W. 1251 in heavy manuring conditions. In the kuruwai group, the yield differences were not statistically significant under normal manuring even though Co. 13 and ASD. 5 gave more yield than ADT. 8. But none of them except ASD. 8 were earlier than ADT. 9 and ADT. 20. Under heavy manuring conditions, these results were significant. ASD. 2 and 6522 (Co. 29) yielded better than ADT. 3 and ADT. 20, but they were longer in duration. The trial will be repeated during 1961-62.

3. *Inter strain yield trial in the Samba season.*—Twenty-four medium and long duration strains of paddy from other centres, were compared among themselves for their performance, in two groups with ADT. 8 as standard. Among the medium duration strains, PTB. 15 maintained its superiority and in the long duration group Co. 25 B, CP. 2 and BCP. 1 gave better yields.

4. *Trial of strains and selections which have done well in the drought resistance scheme.*—Twenty-one samples of strains, selections and varieties of paddy found to do well in the drought resistance scheme work at Tirukuppam were studied during the samba season. The study will be repeated to get conclusive results.

(v) *Manurial trials.*—Varietal response to manuring experiment.—The experiment was repeated this year also. To see the response of different strains of paddy to different doses of manuring, this experiment was conducted in all the three seasons of the year. The manurial treatments were the same for the three seasons having five levels of nitrogen (0, 15, 30, 45 and 60 lb.) and 2 levels (0 and 30 lb.) of potash over a basal dressing of 5,000

pounds of green leaf and 150 lb. of super phosphate per acre. The varieties compared in the three seasons were ADT. 3, ADT. 9, ADT. 16, ADT. 18, ADT. 20, and ADT. 23 in kuruvai, ADT. 1, ADT. 2, ADT. 10 and ADT. 25 in samba and ADT. 8, ADT. 21, ADT. 22, ADT. 24, ADT. 25 and Co. 30 in thaladi seasons. No confirmatory results were obtained from this experiment, at this centre. This being a co-ordinated trial, the results will have to be evaluated in conjunction with the results from other centres.

Fractional application of ammonium sulphate experiment.—This experiment was repeated this year in the Kuruvai, Samba and Thaladi seasons in order to see the effect of application of ammonium sulphate to paddy crop in a single dose and in split doses at different stages of crop growth. There are five treatments in this experiment over a basal dose of 5,000 lb. of green leaf and 150 lb. of super phosphate per acre. The yield differences between the five treatments were not significant in Kuruvai and Thaladi seasons, while they were significant in the samba season. Treatment 2, namely, application of ammonium sulphate in two doses, one half at planting, the other half 60 days after planting recorded better yield.

(vi) *Study of local varieties.*—Study of local minor varieties was started during this year. Forty-four selections were under study and this will be repeated during 1961-62 also to study their characters.

Seed and Plant distribution.—Twenty-nine thousand seven hundred and seventy-eight kilograms of paddy seeds, 40 kilograms of gingelly seeds, 553 kilograms of groundnut, 17 kilogram of castor, 67 of Gliricidia seeds, 34 of vegetable seeds, 31,580 cuttings and seedlings of Gliricidia, 1,545 fruit seedlings, 736 Nos. of vegetable seedlings, 5,626 Nos. of seedlings of various plants, 565 of ornamental plants and 11,000 grass slips were distributed.

(3) Agricultural Research Station, Palur.

Season and crop.—A total rainfall of 67.78 inches was received on 85 days as against 38.74 inches in 45 days of last year and the decennial mean of 43.21 inches in 57 days. The rainfall was fairly normal during June and July and unprecedentedly heavy from the second week of August to the end of November, a period of about three months, when 51.30 inches of rainfall was received in 57 days. A similar concentration of precipitation was recorded within a fortnight in January 1961, when 7.42 inches was received in six days. Mainly dry weather prevailed in the other parts of the year, with occasional light rainfall. The day temperatures fell in November and the average was 77 degree F., and the lowest maximum was 69 degree F. The night temperatures fell from September, and the lowest average of 66 degree F. and the lowest minimum of 50 degree F. were recorded in December. The highest maximum temperature was 101 degree F. and was recorded on two days in May and June 1961.

Seeds distribution.—Large quantities of seeds of paddy and millet strains and oil-seeds multiplied at the station and distributed to the State Seed Farms and to the District Offices. The station also served to meet the demand of orchardists by supplying large number of grafts, cuttings and layers of fruit plants.

Particulars of seeds, seedlings, cuttings, layers and other materials for propagation that were supplied from the station during the year are furnished below :—

Serial number and particulars.	Quantity in Kilograms.	Numbers.
1 Paddy Seeds	10,127	..
2 Millet Seeds	6,794	..
3 Pulses Seeds	195	..
4 Oil Seeds	1,874	..
5 Vegetable Seeds	256	..
6 Green Manure Seeds	536	..
Green Manure Seeds, Seedlings and cuttings.	..	7,800
7 Mango grafts	..	568
8 Sapota grafts	..	356
9 Lemon cuttings	..	423
10 Grape vine cuttings	..	8
11 Other citrus plants	..	215
12 Tapioca setts	..	4,810
13 Grass slips	..	7,000
14 Miscellaneous seedlings and cuttings.	..	782

Paddy.—1. *Evolution of high yielding strains (i) by pureline selection.*—In the yield trial of three Sornavari cultures, culture No. 8812 was superior to the other cultures and the strains TKM. 6 and PLR. 2, but it yielded on a par with TKM. 3.

Thirty-nine selections and five cultures of seven samba were under yield trial in five series. The differences in yield were significant in one series only but none of the selections in that group was superior to the standard strain PLR. 1.

Twenty-one Thuymalli samba selections were compared against the local bulk of that variety and strain Co. 30, in two series. Three selections were found superior to Co. 30, but none was superior to the local bulk standard.

In the trial of Mottakar and Vellakar culture, during the Navara season the Mottakar cultures 10178 and 10169 were superior to the local and to the strains TKM. 6 and PLR. 2 and the Vellakar culture 10015 was superior to the other two Vellakar cultures and the standards, which performance has been fairly consistent.

(ii) *By hybridization.*—Thirty-six families (F. 10) selected from the progenies of the crosses of Japonica types ADT.12 (Indica) were under study. There were no significant differences in yield between the families. In thirty families, the sibs also did not differ significantly from each other a total of nineteen promising cultures was proposed to be carried forward for further yield tests.

Forty families (F.10) from the progenies of *Japonica types* X Indica (CED. 24) crosses, were studied in the Samba season. There was no variation within families, but there were significant differences in yield between some families. Considering the results of the previous years, ten cultures that were highly promising, were proposed to be put to further yield tests.

Nineteen blast resistant cultures from the crosses, PLR 1 X Co. 4 and Co. 26 X Co. 19 were under trial, in separate series. The differences in yield between the cultures were not significant in either series.

Of the six cultures derived from crosses between PLR. 1 and Co. 29, tested in yield trials, four cultures, 4555, 4563, 4543 and 4565 were on a par with PLR 1 and Co. 19 under normal dose of artificial manuring and cultures, 4555, 4565 and 4563 were equal to PLR 1 under high doses of manures. The culture 4555 gave superior performance in previous tests also and the present result testified to its superiority. The culture being equal in yield to PLR-1 and Co. 19 and possessing the added quality of fineness of grain has a good future and will doubtless replace these two strains in this tract.

(iii) *By introduction.*—Four Chinese types CH.2, CH.42, CH.62, and CH.63 were tested against the departmental strains TKM 6, TKM 8 and PLR 2 and culture SW 1261. Under high dose of manuring, CH. 42 yielded on a par with the local strains. CH.62 and CH. 2 yielded on a par with CH.42.

In the early samba season, three medium duration cultures 1246, 4388 and a Labhandai culture were tested against strains, Co. 30, GEB 24, BRM 3 and MTU 19 under both normal and high doses of manuring. In both the set of trials, culture 1246 yielded on a par with highest yielder MTU 19 and was superior to GEB 24 and the Labhandai culture. In previous years 1246 gave an outstanding performance.

Seven short duration strains, namely, PLR 2, TKM 6, Co.13, SW. 1261, ADT 18, ADT 23, and ADT 12 were tested against four blast resistant cultures, namely, 6517, 6522 (Co.29), 732 and 7690 from the cross Co. 18 X Co. 4. Culture 6517 yielded on a par with Co.13 and was superior to TKM 6, PLR 2, and Co. 29. In another series, culture 7382 yielded on a par with ADT 18 and ADT 23 and was superior to 7690, TKM 6 and ADT 12.

2. *Manurial experiments.*—Trials were laid out in the Sornavari, Samba and Navarai seasons to find out the advantage of applying ammonium sulphate, to supply 30 lb. N₂ in two or three split doses, with special reference to application at the shotblade stage of the crop. C.25 in samba and PLR 2 in the other two seasons were grown for this experiment. In the Sornavari season, application in three doses, i.e., at planting and 15 and 30 days after planting respectively recorded the lowest yield. Application in a single dose 80 days after planting, in two doses, first at planting and the second 30 days after planting, or a week before flowering and in three doses, first at planting, second a week before flowering and the third 30 days after planting, yielded without any significant difference between themselves. The differences in yield between the treatments in both the samba and navarai seasons were not statistically significant.

The trials, to test the differential response of six short duration strains, namely, TKM 6, TKM 8, Co.29, PLR 2, Co.13 and Co.18 in the Sornavari season, six medium and long duration strains, namely, CEB 24, Co.30, Co.5, Co. 19, Co.25, and PLR 1 in the Samba season and four strains, namely, TKM 6, Co. 13, Co.18 and Co. 29 in the Navarai season, to ten levels of manuring, were conducted in the respective seasons. In the Sornavari season, the response of varieties to the combined nitrogen and potash manuring was significant, through the isolated effects of nitrogen or potash manuring was not significant. Within the same variety the differences in yield between the ten combinations of manuring were not clear; but within the same level of manuring, the response of the varieties showed significant variations in a few cases. At low levels of nitrogen, TKM 6 and at higher levels C.29 and Co.13 appeared to give a good performance. PLR 2 and Co.18 seem to be lesser yielding than others both at high and low levels. In the Samba season the difference in grain yield due to the varieties, and the levels of manuring, were separately significant, but the interaction between varieties and manuring was not significant. In the Navarai season, the differences in grain yield due to varieties, manures and the interaction between the two were all significant. Co.18 was superior to Co.29 and Co.13, TKM 6 yielded equally with Co.18 and Co.29 and was superior to Co.13. Co.29 also was superior to Co.13. The application of potash showed clear depressing effect on yield with regard to TKM 6 and Co.18 and both of them recorded the highest yields responding to 30 lb. nitrogen alone. Co.18 showed a steady but declining response to high levels of manuring and the yield at 30 lb. N₂ which was the highest, was equal to that of 0 lb. N₂ level. The yield of Co.29 increased up to 30 lb. N₂ level, which was on a par with the highest yield of 45 lb. N₂ level in combination with 30 lb. potash. It is, however, observed that the response of the short duration varieties to manuring was more specific in the Navarai season, when the weather is cold, than in the rather hot Sornavari season.

3. *Cultural experiments.*—In the experiment to test the effect on yield of soaking paddy seeds in soda-bi-carbonate solutions of different concentrations before sowing, the differences in yield between the treatments were not statistically significant in all the three seasons of the year. The strains of paddy used in this trial were TKM 6 for the Sornavari and Navarai season and GEB 24 for the Samba season.

Millets.—Five ragi cultures were tested separately in yield trials in the two seasons. In the May season R.64 and R.58 were superior to the strains Co.5 and Co.7 though they yielded on a par with PLR 1. In the December season PLR 1 recorded the highest yield and cultures R.57, R.27 and R.28 yielded on a par with it. All these were superior to the culture E.C.4728.

Three cultures of cumbu, namely, X.3, AC.30, and AC.116 were tried against cumbu Co.3 and the local in a yield test X.3 recorded the highest yield and was superior to AC.30, Co.3 and the local AC.146 yielded on a par with it. AC.146 was superior to the local.

Poultry.—The Rhode Island Red breed was continued to be maintained for the purpose of demonstration. At the beginning of the year there were 27 hens, six cocks and five pullets. The stock at the end of the year increased to 45 hens and 16 cocks. Of the total of 1,605 eggs obtained, during the year, 366 were sold for hatching, 52 were hatched in the farm, 1,154 were sold for the table purposes and 29 fed to chicks.

Exhibition.—The Farmer's Day at this station was celebrated on 29th December 1960.

(4) Rice Research Station, Tirur.

Two cultures in Vadan Samba, sixteen in Kappa Samba, two in Chinna Samba, three in Kappakar, eight in Mottakar and two in Kesari were found to be consistently better than the standard. The district samples of Kullakar, a red-riced short duration variety of paddy were collected for study.

Nine selections from cross progenies of GEB.24 × Co.10 were found to be promising. Forty-four culture of Japonica × Indica progenies were under yield trial and 163 were under study. One hundred and twenty-eight cultures of Co.10 × Bruna types were under observation. The trial will be continued and the selections with desirable qualities with special reference to non-lodging character will be fixed. The outstanding cultures of cross of GEB.24 × T.260 have been fixed under Drought Resistance Schemes.

In the varietal response to manuring experiment conducted in Sornavari season, two strains, i.e., TKM.6 and Co.13 were found to be better than the others, i.e., TKM.8, TKM.5, Co.18 and Co.29. Under fractional application of ammonium sulphate experiment in Sornavari season, the application of ammonium sulphate in one dose was found to be significantly superior to the rest but on par with treatment 5 (applying in the three split doses 1/3 at planting, 1/3 a month after and 1/3 a week prior to flowering).

In the seed experiment, sowing seeds either behind the country plough or with drill gave better yield than seeds sown broadcast. Soaking seeds, prior to sowing was not found to increase the yields.

District trials.—In the Sornavari season two Chinese types CH.62 and CH.65 were sent to the districts for trial against Co.13 and TKM 3 in six centres. In two centres CH.62 was reported to have yielded better than Co.13 and TKM. 3. Compared to Co.13 the increase in yield was 61.5 per cent and 87.4 per cent whereas against TKM 3 it was 5 per cent and 44.4 per cent. CH. 63 was also found to have out-yielded Co.13 in four centres. The increase being 3.8 per cent, 6.7 per cent, 8.1 per cent and 49.9 per cent where against TKM. 3 the increase were 1.3 per cent and 14.8 per cent in two centres.

Two Chinna Samba cultures 10006 and 10111 were tried against Co.5 in six centres in the samba season. In two centres both the cultures have been reported to have out-yielded the standard. In case of the cut 10006 the increase was found to be 7.8 per cent and 12.0 per cent whereas regarding culture 10111 it was 10.9 cent and 20.0 per cent.

One culture 10435 in Kesari variety of paddy was tried against Co. 18 and TKM 6 in six centres in Navari season. In four centres it was found to have out yielded both the standards. Compared to Co.18, the increase was 4.2 per cent, 15.1 per cent, 19.2 per cent and 22.2 per cent whereas against TKM 6 it was reported to be 8.9 per cent, 19.0 per cent, 31.0 per cent and 39.2 per cent.

Drought resistance scheme.—Two outstanding cultures 8,405 and 9754 of cross GEB. 24 × T. 260 were tested against ADT. 22 in four centres in Samba season under wet and semidry conditions. It was seen that culture 9,754 recorded increased yields ranging from 10.0 per cent to 16.7 per cent over the standard.

A quantity of 28,667 kg. of paddy seeds, 1,414 kg. of vegetable and other seeds, 43,498 numbers of seedlings, layers and cuttings was distributed from the station. Paddy seeds of TKM 1 to TKM 6 and strains of other stations suitable to this tract also were distributed.

(5) *Agricultural Research Station, Bhevanisagar.*

Season and rainfall.—During the year under report a total rainfall of 594.53 m.m. was received and it was short by 101.92 m.m. than the average rainfall of 696.45 m.m. for the last 9 years. This rainfall was distributed over 38 rainy days as against an average of 43.14 rainy days. During the last year a total of 798.19 m.m. rainfall was received in 49 rainy days. During the South-West Monsoon period a total of 182.74 m.m. rainfall distributed in 14 rainy days was received as against an average of 127.79 m.m. rainfall in 10.30 rainy days, and 242.94 m.m. rainfall in 22 rainy days during the last year. The rainfall was helpful for preparatory cultivation and sowing in dry land area but inadequate rainfall after the germination of crop resulted in complete failure of cumbu and patches of successful cholam crop. During the North-East Monsoon, bulk of the rainfall was received between the last week of October and the second week of November 1960 and this has dislocated the important operation like weeding and application of manures of most of the crops. A total of 278.01 m.m. rainfall distributed in 19 rainy days, was received during the North-East Monsoon as against an average of 358.04 m.m. rainfall received in 20.29 rainy days and 378.64 m.m. in 18 rainy days during last year. This rainfall is short by 80 m.m. from the average. In case of hot weather period a total of 133.80 m.m. rainfall in 5 rainy days, was received, as against an average of 216.62 m.m. rainfall in 12.55 rainy days.

Reclamation and lay-out operations.—A total of 4.50 acres was reclaimed during the period under report and the area was brought under paddy cultivation. In addition to the above an area of about 6.50 acres were levelled by the bulldozer to facilitate easy irrigation in Orchard Block and Fish Pond Block of the station. A length of 950 feet was sown with prosopis for gap filling wherever there was gap in the existing live fence. The irrigation channels and bunds were maintained to a length of about 4,250 feet.

Field experiments and investigations.—The following experiments were conducted during the period under report on various crops in the existing project condition as formulated in the Three-year Programme of research of the stations:—

(a) Rotation experiment to assess the best two year rotation of crops.

(b) Varietal trial on ragi, paddy and cotton to isolate the best yielding departmental strains for distribution in the project area.

(c) Cultural experiment to determine the optimum period of sowing for cotton 9030G and groundnut TMV.2 in the second season.

(d) (i) Manurial experiment to fix the optimum and economic dose of organic and inorganic manures for ragi during both seasons and for cumbu in the first season of the project area.

(ii) Placement of fertilisers for cotton and cholam to find out the relative superiority of methods and fix up the manurial dose for getting maximum productions with economics of labour for application of manures.

The observations made in each experiment are summarised below:—

(a) **Rotation experiment.**—From the yield and cultivation charges incurred for the two-year rotation of crops it was observed that a maximum profit of Rs. 793 acre was obtained from the rotation cotton, cholam and groundnut is more remunerative to the ryots of this area than other rotations.

(b) **Varietal trials.**—(i) **Ragi (I Season)—August to November.** From the trial conducted during the year it was noted that the maximum yield of 1,075 lb. of grains or 118.7 per cent over general mean was attained from the strain PLR.1. It was found statistically superior to other strains of ragi.

(ii) **Ragi (II Season)—(January to April).**—From the yield obtained from the second season trial, it was found that the highest acre yield of 3,130 lb. of grain was obtained from the strain PLR.1 and the next best yield of 2,193 lb. was got from Co.3 PLR.1 was found to be shorter in duration than other strains. The statistical analysis is under way.

(iii) **Paddy (II Season) (January to May).**—It was seen from the yield data that the maximum yield of 4,029 lb. per acre or 111.7 per cent over general mean was obtained from the strain Co.18 and it was closely followed by the strain Co.23 with a yield of 3,802 lb. per acre or 102.5 per cent over general mean of 3,618 lb. per acre. The highest yield from Co.18 was not significantly superior to other strains.

(c) **Cultural trial (time of sowing)**—(i) **Cotton 9030G.**—The yield data obtained from the trial, indicated that the sowing of cotton MCU.3 on 25th August 1960 was significantly superior to other later sowings with a yield of 654 lb. of kapas per acre and the next best yield was from 15th August 1960 sowing. There was gradual decrease in yield when the sowing was delayed. The yield obtained from 5th October 1960 sowing was almost 50 per cent of the yield obtained from 5th September 1960 sowing.

(ii) **Groundnut TMV.2 (Second Season).**—The yield data of the trial indicated that the maximum yield was obtained from 30th December 1960 date of sowing.

(d) *Manurial experiment*—(i) *Cumbu*.—The response of cumbu to 60 lb. Nitrogen in combination with 20 lb. P_2O_5 and 20 lb. K_2O was more prominent with 1,152 lb. per acre than other treatments but 40 lb. nitrogen alone stood second with an acre yield of 1,091 lb.

(ii) *Ragi*.—From the yield obtained from the trial it was seen that the maximum acre yield of 2,235 lb. was obtained from the treatment 60 lb. nitrogen with 20 lb. phosphate and 20 lb. potash.

(iii) *Cholam*.—The yield obtained from the trial indicated that the application of fertilizers 2 inches apart on either side of the rows and in the middle of the rows was better than other treatments. Similarly application of straight fertilizers like ammonium sulphate, superphosphate and potash was found to be superior than the standard mixture.

(iv) *Cotton*.—With regard to cotton yields, the application of fertilizer in the middle of two rows has recorded the maximum yield. Here again the application of straight fertilizers appeared to be superior than the standard mixture.

Performance of crops—(a) *Paddy*.—An area of 46.28 acres of paddy was raised during both seasons. The strain ASD.5 has recorded acre yield of 3,212 lb. in 21.43 acres, whereas TKM.6 recorded only 1,409 lb. per acre in 24.80 acres. The crop raised in the first season got a basal dressing of 6,000 lb. of gliricidia leaves but not in the second season. The crop received 30 lb. nitrogen as top dressing from ammonium sulphate or urea as the case may be.

(b) *Cotton*.—A total area of 18.38 acres was sown with MCU.1 cotton during September 1960 and the crop condition was quite satisfactory. An average acre yield of 542 lb. was recorded during the year under report.

(c) *Millets*—(1) *Cholam*.—An area of 20.76 acres was raised under irrigated condition and an approximate yield of 487 lb. was recorded. As far as dry land crop was concerned the yield was very poor and only 275 lb. of grain per acre alone was recorded.

(2) *Cumbu*.—The crop was raised in an area of 50.13 acres during the year. Only Hybrid cumbu and parents were multiplied for distribution. The Hybrid cumbu X.3 recorded a yield of 504 lb. per acre. The parents PT. 826/7 and PT. 828/9 raised in 3.49 acres recorded an average yield of 1,276 lb. per acre. The crop raised under rainfed condition was a thorough failure and this brought down the average yield of cumbu.

(3) *Ragi*.—Ragi Co. 1 was raised in an area of 10.5 acres and the crop was quite good. An average yield of 1,201 lb. per acre was obtained.

(d) *Oilseeds*—(1) *Groundnut*.—TMV. 2 groundnut was raised in an area of 57.00 acres for nucleus seed multiplication in both the seasons. An average acre yield of 373 lb. was obtained from the irrigated crop of TMV. 2 groundnut. TMV. 3 groundnut was raised in 1.5 acres under rainfed conditions. The crop was completely affected by red hairy caterpillar and the yield was very poor. It was only 130 lb. per acre.

(2) *Gingelly*.—TMV. 3 gingelly was grown in 2.97 acres in the second season. The condition of the crop was satisfactory but the capsules borer attack was so severe that the yield was considerably low and it was only 62 lb. per acre.

(e) (1) *Tobacco*.—The variety Vatta Kappal was raised in an area of 5.27 acres during the year. All precautions and control measures were taken against pest and diseases. The crop was very good and the yield of cured leaves was 1,009 lb. per acre.

(2) *Chillies*.—Sathur samba variety of chillies was planted in an area of 1.36 acres. The crop received spraying of cupravit and folidol against fruit rot and thrips respectively. An yield of 1,000 lb. per acre was obtained after drying.

(f) *Vegetables*.—Various kinds of vegetables like brinjal, tomato, bendai, cluster beans and lab lab were grown in small areas. The area grown under different kinds are (1) tomato 25 cents, (2) brinjal 30 cents, (3) bendai 15 cents, (4) cluster beans 5 cents and (5) 20 pits of different lab lab varieties. The yields obtained from the above vegetables are tomato 11,600 lb. per acre, brinjal 10,500 lb. per acre, bendai 2,200 lb. per acre, cluster beans 700 lb. per acre and 160 lb. of lab lab.

(g) *Green manures*.—During the year under report an area of 22.96 acres was sown with sunhemp. A total of 4,400 lb. of seeds were collected from 7 acres, and the rest ploughed in situ. The total quantity of green leaves produced from Gliricidia was 285,826 lb. From the sunhemp crop, 166,896 lb. of leaf was produced and incorporated in the soil. Seeds were collected to an extent of 515 lb. in Gliricidia. A total of 86,900 seedlings and 2,000 cuttings of Gliricidia were produced for distribution.

(h) *Manure production*.—During the year under report a total of 4,230 tons of compost was prepared from farmyard manure, green leaves and farm wastes. This can be considered to be an achievement during the year and the station is self-sufficient as far as manure is concerned.

(i) *Vanamahothsava*.—During the year under report 50 seedlings of *Delonix regia* and 25 seedlings of *Singapore kapok* were planted at the time of Vanamahothsava week. For raising seedlings for distribution 18 lb. of *Cassia marginata*, 11½ lb. of *Feltophorum ferruginum* and 1½ lb. of *Delonix regia* seeds were grown in nurseries.

Scheme for the Development of Burghur Cattle.—The construction of the cattle shed and office was completed during the year. The scheme was continued for one more year from 1st July 1960 to 30th June 1961 as sanctioned in G.O. Ms. No. 941, Food and Agriculture, dated 12th March 1960. The opening balance of 47 animals increased to 69 animals due to 22 births during the year. There were no sales or death or transfers during the period. The closing balance of 69 animals found at the end of the year is made up of 3 dry cows, 1 nearing parturition, 22 milch, 11 heifers, 8 young bulls, 11 heifer calves, 11 bull calves and 2 stud bulls.

Out of 23.42 in the herd, an average of 13.82 were in milk and they produced 31,379.5 lb. of milk with a daily average of 5.90 lb. for cows in milk and 3.67 lb. for cows in the herd as against the total yield of 7,991.5 lb. of milk with daily average of 5.61 for cows in milk (3.82) and 1.05 lb. for cows in the herd (20.81) during last year (1959-60).

Out of 23.42 in the herd, an average of 13.83 were in milk were drawn from the udders during the year, as against 2,799.25 lb. of milk of last year. The milk thus produced was disposed off by sale of 15,415.00 lb. calf feeding of 748.75 lb. for weak and under-fed calves, calf feeding of colostrum of 97.00 lb. and free distribution of 3.00 lb. on Tamil New Year Day.

Bulls.—Fifty-three services were performed on farm cows by the farm bulls and 22 calves were born during this year as against 8 calves born during last year.

Sterility test, preventive treatments, proper management and feeding were undertaken.

Fourteen cows and heifers were segregated since they were positive reactors for Brucellosis and due precautions were under taken.

During this year the Scheme animals participated in the Third Madras State Cattle Show at Madras and annexed, the Supreme Championship Cup for the best animal of the Burghur breed in addition to annexing three first prizes and two second prizes.

(6). *Rice Research Station, Ambasamudram.*

Season and rainfall.—During the period under report there was a precipitation of 59.02 inches rain in 77 rainy days as against 38.32 inches rain in 33 rainy days of last year. 5.86 inches were received during the South-West Monsoon period, 40.49 inches in the North-East Monsoon period and the rest in the hot weather period.

Farm operation.—Out of a total area of 21.26 acres in both Kar and Pishanam seasons, an area of 8 acres was occupied by different experiments, viz., manurial and cultural, yield trials and interstrain trials, etc. Only one acre was utilized for raising nursery for Kar and Pishanam seasons. Remaining 16.36 acres were planted with bulk crops. A total quantity of 19,706.331 Kg. of seeds was obtained besides the production of mixture paddy, 6,381.667 Kg. and cattle threshed paddy which were disposed of to the public by auction sales after reserving sufficient quantity for distribution among the Farm Mazdoors and staff for consumption purposes.

Research—(1) *Improvement of paddy by pureline selections—Maikuruvai*.—The yield trial of Maikuruvai with promising cultures 962, 873 and 895 was conducted under two levels of manuring this year. They are normal manuring and heavy manuring conditions:—

	Normal manuring. Lb. per acre.	Heavy manuring. Lb. per acre.
Green leaves	5,000	6,000
Super phosphate	150	225
Ammonium sulphate	150	200

Normal manuring.—Under this level of manuring culture 895 was the highest yielder recording 4,207 lb. per acre with an increase of 14 per cent over the standard Maikuruvai, while the culture 962 had production of 3,467 lb. per acre, the lowest yield. But culture 895 was not statistically superior to the standard, since the result was not statistically significant. Under heavy manuring, culture 895 was the highest yielder recording an increase of 14.1 per cent over the standard Maikuruvai and it is on a par with culture 962 which recorded an increase of 7.3 per cent over the standard. Culture 873 was the poor yielder recording only 3,844 lb. per acre which is inferior to the standard.

Seenganni.—It was tested against 639, 659, 662 and 679 under two levels of manuring.

Under normal manuring, culture 639 was the highest yielder with an increase of 15.6 per cent over the standard and culture 639 is on a par with cultures 662 and 679.

Under heavy manuring, though the difference between the yielding power of the cultures was not significant, culture 679 has produced the maximum yield of 3,842 lb. per acre with an increase of 14.2 per cent over the standard.

Arikiravi.—It was tested against 8748 and 8689 under two levels of manuring, i.e., Normal and Heavy.

Under normal manuring, the yield differences were not significant and culture 8748 produced 2123 lb. of grain per acre with very low increase of 0.6 per cent over the standard.

Under heavy manuring also the yield differences were not significant but culture 8689 produced an yield of 1,731 lb. of grain per acre with an increase of 85.2 per cent over the standard and culture 8748 produced 1,646 lb. of grain per acre with an increase of 49.4 per cent over the standard, while the standard Arikiravi yielded only 1,102 lb. of grain per acre.

Senshuli.—It was tried under two levels of manuring with cultures 984, 1047, 1617, 1095, 1592, 1104 and 1113.

Under normal manuring, culture 1617 was the highest yielder and it recorded 2,509 lb. of grain per acre with an increase of 53.2 per cent over the standard which produced only 1,637 lb. of grain per acre. Culture 1617 was on a par with cultures 1592, 984, 1095 and 1113.

Under heavy manuring, the yield differences were not significant and the culture 984 was the highest yielder with an increase of 58.8 per cent over the standard, which recorded 1,532 lb. of grain per acre.

Hybridisation.—Fourteen short duration (kar season) direct and back cross progenies of Japonica and Indica., viz.,

- (1) Norin 6 × ADT.12.
- (2) Norin 8 × ADT.12.
- (3) Norin 18 × ADT.12.
- (4) Norin 20 × ADT.12.
- (5) Asahi × ADT.12.
- (6) Zumbazoo × ADT.12.
- (7) Rikku 132 × ADT.12.
- (8) Taichu 65 × ADT.12.
- (9) (ADT.12 × Norin 6) × ADT.12.
- (10) ADT.12 × (Asahi × ADT.12).
- (11) ADT.12 × (Taichu 65 × ADT.12).
- (12) ADT.12 × (Norin 6 × ADT.12).
- (13) ADT.12 × (Norin 20 × ADT.12).
- (14) ADT.12 × (Zumbazoo × ADT.12).

received from the paddy Specialist were under observation from 1953-54. They are segregating for duration grain size, pigmentation awning, etc. 158 single plants selected during last kar 1960-61 were sown now for further study.

Another 4 sets of long duration direct and back cross progenies of Japonica and Indica, viz.,

- (1) Taichu 65 × GEB.24.
- (2) Norin 20 × GEB.24.
- (3) GEB.24 × (Norin 20 × GEB.24).
- (4) Rikku 132 × GEB.24.

were also received from the Central Rice Research Institute, Cuttack through the Paddy Specialist in 1953-54 and were tried under higher fertility condition. 127 single plants were selected for further study during 1961-62 Pishanam Season.

Introduction.—Interstrain trial has been conducted with the object of testing the suitability of out-station strains with the strains evolved from this station.

This trial also was conducted under 2 levels of manuring as stated already.

Series—I.—ADT.9, ADT.12, ADT.16, Co.10, Co.18, and Co.29 (6552) have been tried with ASD.1 evolved from this station.

Under normal manuring, no out-station strain has recorded more yield than ASD.1 which is the highest yielder recording 4,794 lb. of grain per acre followed by Co.18 with an acre yield of 3,956 lb. of grain and it is on a par with ADT.12, ADT.9, Co.10 and Co. 29. ADT.16 was the poorest yielder recording only 3,249 lb. of grain per acre.

Heavy manuring.—Under this level of manuring, though the yield differences were not significant, ADT.9 has recorded the maximum yield of 4,438 lb. of grain per acre with an increase of 6.9 per cent over the standard ASD. 1.

Series—II.—In the series TKM.3, PLR.2, TKM.6, ADT.3, ADT.20 and Co.13 were tried against ASD.1 under 2 levels of manuring as stated above.

Normal manuring.—Under this level of manuring ASD.1 was the highest yielder recording 4,617 lb. of grain followed by PLR.2 which recorded 4,193 lb. of grain and it is on a par with Co.13 which produced 4,182 lb. of grain. ADT.3 is on a par with TKM.6 and TKM.3 and all of them produced 3,925 lb., 3,892 lb., 3,789 lb. of grain per acre respectively. ADT.20 only produced the lowest yield, 3,578 lb. of grain.

Heavy manuring.—Though the yield differences were not significant, PLR.2 has recorded the highest yield of 4,530 lb. of grain per acre with an increase of 11.5 per cent over the standard and PLR.2 is on a par with Co.13, TKM.6, and ASD.1. ASD.1 is on a par with ADT.3.

Manurial experiments.—To find out the interaction between the varieties to different levels of Nitrogen this experiment has been laid out.

<i>Kar Varieties,</i>	<i>Pishanam varieties.</i>
ASD 1	ASD 5
ASD 2	ASD 6
ASD 7	ASD 11
ASD 8	Co. 2
ASD 9	Co. 19
TkM 6	Co. 25

Manuring.—All the treatments were supplied with an uniform basal dressing of 5,000 lb. green leaves and 150 lb. Super-Phosphate per acre. There was 5 levels of Nitrogen and 2 levels of K₂O. Nitrogen levels 0 lb. 15 lb., 30 lb., 45 lb., and 60 lb. Nitrogen.

Potash levels.—0 and 30 lb., K₂O. The trials revealed that ASD.1 in kar season and Co.25 and ASD.11 in Pishanam season recorded significantly better yield than the rest of the strain.

Practical application of Ammonium Sulphate Experiment.—To find out the effect of top dressing of Ammonium Sulphate in two or three doses with special reference to its application at earing stages, the trial was conducted in kar and pishanam season with ASD.1 and Co.25 respectively.

Treatments.—(1) 30 lb. Nitrogen in one dose, one or two months after planting according to duration.

(2) 30 lb. Nitrogen in 2 doses one at planting and the other one or two months after planting.

(3) 30 lb. of Nitrogen in 2 doses, one at planting and the other one a week before flowering.

(4) 30 lb. of Nitrogen in 30 doses one at Planting, second 15 or 30 days after planting and third, one or two months after planting.

(5) 30 lb. of Nitrogen in 3 doses one at planting, second dose one or two months after planting and the third a week before flowering.

During Kar 1960-61 treatment 3 has recorded the highest yield and it is on a par with treatment 2 and treatment 5. During Pishanam 1960-61 the yield differences were not significant.

Time of application of nitrogenous fertilisers.—To find out the applicability of the recommendation of the rice research workers' conference that in the case of early maturing varieties which take 100 days or less all the Nitrogen should be applied at planting time an experiment was laid out for the first time during 1960-1961 kar in split plot design with the following treatments.

(a) *Fertilisers.*—(1) Ammonium Sulphate, (2) Urea.

Thirty lb. of Nitrogen will be applied over a basal dressing of 5,000 lb. of green leaf and 150 lb. of super phosphate per acre.

ASD.1 and ASD.8 were selected for this trial.

Treatments.—(1) All the Nitrogen at planting.

(2) Half at planting and half 30 days after planting.

(3) All the Nitrogen 30 days after planting.

Ammonium sulphate was found better than Urea for better production and treatment 3 was superior to the rest 2 treatments. But urea has increased only the production of grain.

Summer ploughing experiment—Cultural experiments.—The trial was laid out to compare the cultural practices adopted by certain section of ryots with those adopted at this station and to test the soundness of giving repeated dry ploughing to the paddy fields during the summer months of April and May. During 1960-61 the yield differences between the 2 months were not statistically significant.

Miscellaneous—Groundnut in rice fallow.—An area of 0.85 cents was sown with A.H. 3490, a bunch variety of groundnut with the duration of about 100 days. The crop was satisfactory and it has been harvested.

Green Manure Crop.—An area of 3.45 acres was sown with sesbania in the rice fields a week before the harvest of Pishanam crop and the crop has produced sufficient quantity of green manure for the farm requirement. 14,300 sesbania seedlings and 1945 gliricidia cuttings were distributed.

Vegetables.—A small area of about 20 cents available in the station was sown with Bendai, Bittergourd and snakegourd, and 7.8 kgms. of seeds were produced.

Live stock.—A total of 300 parts worked during the year under report and the Murrah Buffalo was transferred to the District Veterinary Officer, Tirunelveli, on 12-8-1960. The condition of animals was satisfactory.

Seeds produced :—

Paddy seeds	...	...	19,706—331 kg
Mixture paddy	...	...	6,385—667 kg.
Cattle threshed paddy	...	...	1,946—535 kg.

Miscellaneous :—

Guinea grass slips	...	...	5,100 Nos.
Croton cutting	...	...	22 Nos.

(7) *Agricultural Research Station, Koilpatti.*

Season.—A total rainfall of 37.32 inches in 47 rainy days was recorded during the period as against 39.49 inches in 59 rainy days recorded during the previous year. The rainfed sowings were taken up only during the last week of October, 1960 after getting soaking rainfall and continued upto the first week of November, 1960. The germination was quite satisfactory in all the three major crops, viz., Karunganni, Cotton, Irungu Cholam (Fodder variety) and Cumbu. The weeding and inter-cultivation operations were delayed due to frequent rains received during the whole of November, and with the bright weather conditions that set in, from the middle of December, all the rainfed crops pulled up. In the rainfed black soil an area of 39.83 acres under Karunganni cotton (K.6 and K.2), 26.25 acres under Periamanjai Irungu Cholam (K.3) and 14.61 acres under Cumbu (K.1) were grown during the year.

Breeding.—Improvement of Millets, viz., Cholam, Cumbu, Ragi and Kudiraivali through selection and hybridisation 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, and the same is under the control of one Research Officer designated as Assistant Crop Specialist, Chillies scheme, Agricultural Research Station, Kovilpatti. A new scheme for maximisation of phosphate potential in soils of Madras was started on 29th October 1960. The object of the scheme is to study the uptake of phosphate, applied as Super phosphate and Rock phosphate in different doses to the rainfed black soils at Kovilpatti tract. The up-take of phosphate will be assessed by the analysis of soil samples and plant materials. The crops selected at this station are (i) Cumbu (an important cereal food crop) and sunhemp (a leguminous green manure crop). The scheme is financed by the Indian Council of Agricultural Research and is to run for three years.

Work on the isolation of bold grained types of the fodder-cum-grain strain periamanjai irungu cholam is in progress. Six promising selections with higher yields than the standard strain K.3 are advanced to further trials. Among the six promising selections, three of them are found to possess bold grains also. Among the twelve promising irrigated vellai cholam types seven selections earlier than the standard K.2 (Vellai cholam) by about 5 to 10 days associated with higher yield are tested in comparative yield trials, during the summer season 1961. Work on the improvement of the straw quality of cholam K.2 by crossing it with Co.18 (RASA kesuri vellai cholam strain) is in the F.5 stage. Thirty promising hybrid progenies with the desirable character combination are tested in preliminary yield trials.

In cumbu out of the eleven single crosses tested, ten were found to be significantly superior to K.1 (Standard). These crosses await yield tests.

In Ragi, work on the isolation of short duration ragi (95 to 110 days) selections, shorter than the existing strain K.2 (130 to 140 days) with the same yield potentiality as that of K.2 is in progress. During the period under report nine short duration (110 days) and promising selections are tested in preliminary yield trials against K-2 as standard. Among them six are found to be significantly better in yield than K-2. The trials will be repeated again.

From the 14 selections, from the previous year five promising selections of Kudiraivali, are tested in comparative yield trials against the standard. All the five selections did not reach the level of significance even though they recorded numerically high yield than the standard strain. Another set of 7 promising Kudiraivali cultures, collected from the districts await further trials.

A crop weather scheme to collect Meteorological data is functioning at this station. Routine readings at schedule hours were made and recorded. Soil moisture estimation was done weekly.

Distribution of improved seeds.—The following quantities of seeds of improved strains were supplied to the extension staff :—

(a) *Millets :—* *Quantity supplied in Kilos.*

(1) Cholam K.2.	...	...	...	...	1,542
(2) Cholam K.3.	...	...	...	...	928
(3) Cumbu K.1.	...	...	...	...	1,320
(4) Ragi K.1.	...	...	...	...	60
(5) Ragi K.2.	...	...	...	...	780

(b) *Cotton :—*

(1) MCU.2. Cotton	...	...	...	...	525
(2) K.6. Karunganni Cotton	...	...	...	...	2,300

(c) *Miscellaneous seeds and plants.*—The following quantities of Miscellaneous seeds and plants were also supplied to the Extension Staff :—

Quantity distributed (Kilos).(a) *Seeds :—*

(1) Prosopis juliflora	...	...	...	...	40
(2) Gliricidia	...	...	...	...	5
(3) Kapok	...	...	...	...	25
(4) Brinjal	...	...	...	...	6
(5) Lab-lab	...	...	...	...	1.5
(6) Greens (Keerai seeds)	...	...	...	...	2
(7) Gourds	...	...	...	...	2

(b) *Fruit plants :—*

	<i>Numbers.</i>
(1) Nepali lemen layers	49
(2) Hawaii citron	8
(3) Papaya seedlings Co.1	1300
(4) Guava Layers (Allahabad variety) ...	30
(5) Grape vine Anab-E. Shahi Rooted cuttings)	20
(6) Curry leaf seedlings	30
(7) Custard apple	23

(c) *Grasses and green manure plants :—*

(1) Grass slips	50,400
(2) Gliricidia cuttings	2,650
(3) Ipomea cuttings	1,500

(d) *Compost produced* : 375 tons.

In addition to the above, 1,011 numbers of eggs of Rhode Island Red variety of poultry and 6,023 kilos of milk were produced and sold at the Research station.

(8) *Agricultural Research Station, Tindivanam.*

Season.—A total rainfall of 47.17 inches distributed over 56 rainy days was received as against 33.59 inches on 45 days of last year and the past ten years average of 35.89 inches on 49.9 days. The rainfall was deficit to an extent of 2.12 inches during the hot weather period and in excess by 1.05 inches and 12.35 inches over normal during south-west and north-east monsoon periods, respectively. The late sowings of groundnut due to late setting of the south-west monsoon with a spell of drought during the first flowering, followed by heavy unprecedented heavy rainfall of 21 inches during the first eighteen days of November, affected the yield of both groundnut and castor adversely. The cold weather crop of gingelly recorded normal yields. The season in general was unfavourable to groundnut and castor and favourable for gingelly (cold weather crop).

Results—A. Groundnut.—A high yielding semi-spreading selection, A.H. 6719 suitable for snach purposes was released as strain TMV.6. A spreading selection, A.H. 6885 (East Africa) consistently superior to all the three standards in three years of yield trials at the station and recording an average increase of 37.7, 16.0 and 25.6 per cent over local and strains TMV.1 and TMV.3 respectively was multiplied for trials in the districts during 1961-62. Two selections in bunch and ten of the spreading were in different stages of yield trials in comparison with their standards. The yield differences were significant. One of the two bunch selections, A.H. 6875 recorded 13.7 per cent increase over TMV.2 and was

on a paro with it. This registered an average increase of 8.4 per cent over TMV. 2 in three years of yield trials at the station. In the yield trial with the ten spreading selections, eight were superior to local recording increased yields ranging from 20.1 to 48.9 per cent. One of these, A.H. 6888 in the third year of trial, was superior to strain TMV. 1 also. This on an average gave increased yields of 35.3, 12.2 and 11.8 per cent over local and strains TMV.1 and TMV.3 respectively. Bunch selection A.H. 6875 and spreading selections A.H. 6888 that proved to be economic in three years of yield trials at the station, will be multiplied during 1961-62. Six spreading selections were multiplied for conducting preliminary yield trials. Thirty-six out of 200 single plant selections of the spreading variety collected from Melgudalur (Mathurai) out-yielded their adjoining controls and were advanced to replicated row trials. In the new cultural trials with four main and two sub-treatments conducted for the fourth year, the yield differences were not significant both in the main and sub-treatments. However "ploughing eight time with iron plough" in the main treatment and "Working Danthis Twice" in the sub-treatments yielded 12.7 and 6.9 per cent increase respectively over 'ploughing four times with country plough (Control)' in the main treatment and "Working Danthis four Times" in the sub-treatments. In the spacing trials with the bunch varieties conducted for the fourth year, the yield differences were not significant. However broader spacings, 12" x 3", 9" x 4" and 18" x 2" recorded 11.5, 7.6 and 1.0 per cent increase over the normal spacing of 6" x 6". In the fertiliser placement trials with two manure mixtures with two placements in each conducted for the fourth year with the bunch variety, the yield differences were not significant. However, all the manure treatments gave increased yields ranging from 8.6 to 23.7 per cent over 'No manure' (control). M.M. 1 side placement recorded the highest yield. Thirteen high yielding selections, comprising five of the spreading and four in each of the semi-spreading and bunch were field tested in 38 centres in the districts. The five spreading selections gave 22.0 to 53.1 per cent increased yields over the local varieties, A.H.6795 recording the highest yield in most of the centres. The four semi-spreading selections registered increased yields ranging from 22.1 to 34.3 per cent over the local, while the four bunch selections recorded increases ranging from 3.8 to 17.8 per cent over the local bunch.

B. Gingelly—1960 summer.—Of the ten selections compared with strain TMV. 3 in two groups of yield trials, the yield differences were not significant, though five selections recorded increased yields up to 6.8 per cent over local. One of the five, S.I.1225 (Gaya) yielded on an average 8.5 per cent increase over local and as much as strain TMV.3 in three years of yield trials at the station. This was advanced for multiplication during 1961 summer for large scale trials in the districts during 1962. In the preliminary yield trials with ten selections in two sets, the yield differences were not

significant. However, four selections registered increased yields up to 20.9 per cent over local. Of the 47 selections tested in three series of replicated row trials, five selections registered increased yields up to 13.7 per cent over TMV.3, though the yield differences were not significant. In the manurial trials conducted for the third year, the differences in yield due to treatments were significant. Treatments NPK, NP, NK and N were significantly superior to 'No manure' recording increased yields ranging from 28.7 to 36.5 per cent over control. The average of three years results indicated the superiority of treatments NPK, NP, NK and N which registered increased yields ranging from 2.0 to 31.7 per cent over control. Treatment N alone was found remunerative.

1960-61 cold weather.—The yield trial with 5 selections conducted during 1959-60, was repeated for the second year. Thirteen selections were compared with local and TMV.2 in two groups of preliminary yield trials. Four selections were also tested in a replicated row trial. The existing 30 varieties and eight fresh collections of Grecian origin were studied in great detail. All the eight varieties from Greece were observed a week earlier in duration than strains TMV.2 and TMV.3.

1961 summer.—Thirteen selections were sown under yield study groups. Fourteen hybrids and 85 selections from the F2 and F3 progenies of crosses designed to evolve white seeded cosmopolitan strains were under detailed study.

C. Castor.—Six medium duration selections were compared with strains TMV. 1 and TMV. 2 in two groups of yield trials. The yield differences were significant. Four of the six were significantly superior to TMV. 2 registering increased yields ranging from 37.4 to 73.2 per cent over the standard. One of the four, X. 118/2 (Horticultural type × TMV.1) in the third year of trial recorded 37.4 per cent increase over TMV.2 but was on a par with TMV.1. This gave on an average 7.9 per cent increased yield over TMV.2 in three years of yield trials at the station and will be multiplied for trials in the districts during 1962-63. In the preliminary yield trials with five short duration ($4\frac{1}{2}$ to $5\frac{1}{2}$ months) selections, two recorded 4.7 and 20.5 per cent increase over general mean, though the yield differences were not significant. In the replicated row trial with five medium duration ($3\frac{1}{2}$ to $6\frac{1}{2}$ months) selections, three registered increased yields up to 39.5 per cent over TMV.1, though the yield differences were not significant. In the district trials with five short duration selections, all the five recorded increased yields up to 12.5 per cent over the local varieties. Eighteen fresh crosses were made between selected parents to reduce the duration and impart colour to strains. Seventy-seven single plants were advanced from F2 and F3 progenies of crosses designed for the same purpose for further studies. Five families of hybrids from the

crosses between highly pistillate strain TMV.1 and five high yielding inbreds were compared with TMV.1 and the male parents in a compact family block. The yield differences were not significant either in the family or sib-analysis. However, three hybrids registered increased yields ranging from 5.2 to 12.6 per cent over TMV.1, the female parent. Five new varieties, three from Marseilles and one irradiated material in each of strains Co.1 and TMV.1 were studied. None of them compared favourably with CO.1 or TMV.1. One hundred and sixty-one inbreds were maintained pure.

Schemes—(i) *Intensive breeding of groundnut in the Madras State.*—This was initiated on 30th June 1955. The object of the scheme is to evolve by pureline selections and by hybridization (a) high yielding dormant bunch strains, (b) white seeded strains, (c) big seeded strains suitable for desert purposes and (d) to improve the shelling outturn of strain TMV.1.

Four hundred and eighty new varieties, representing 462 of the previous years and 18 of Chinese origin received during the period were raised and studied. Among the 18 varieties, a new erect form was noticed. Twenty-four single plants were marked from these for further study. Eight species of *Arachis* were also maintained along with the collections. One hundred and seventy-two promising selections were under initial yield trials and 105 of these superior to their standards were advanced to next stage of yield trials. Fourteen bunch and 89 spreading selections of various stages of yield trials were multiplied. Sixteen and 12 spreading selections were tested under preliminary and comparative yield trials respectively in comparison with their standards. Eight selection of the former group expressing superior performance were advanced to comparative yield trials. In the latter group, four selections were significantly superior to the local. Under the hybridisation programme for the four set purposes of the scheme, 16 dormant bunch, 21 white seeded selections, 84 big-seeded and 38 others with good shelling outturn were multiplied for rigid yield trials. Three selections with high shelling outturn were compared with local in a preliminary yield trial, and all the three were superior to the standard. Of the 290 selections tested in initial yield trials, 95 superior to the standards were advanced to further stages of trials. From 331 F2 and F3 progenies of crosses and back-crosses, 847 single plants were isolated for further study. In addition, 16 fresh crosses were also effected.

(ii) *Scheme for running zonal nucleus seed farms of groundnut and castor.*—During the period, an area of 53.69 acres was sown with groundnut strains TMV.1, TMV.2, and TMV.3 and castor strain TMV.2 for multiplication. The details regarding the 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 the Zonal Nucleus Seed Farm, Tindivanam, for the period from 1st July 1960 to 30th June 1961.

Name of strain.	Area sown in acres	Total Quantity of dry pods obtained in lb.	Yield per acre in lb.	Total Quantity of picked pods obtained in lb.	Quantity despatched to the district officer in lb.
(1)	(2)	(3)	(4)	(5)	(6)
(i) Groundnut TMV. 1	10.00	2,420	242	1,800	770
(ii) TMV. 2.	13.69	10,380	758	6,220	4,125
(iii) TMV.3.	25.00	7,750	310	5,440	*
(iv) Castor TMV. 2	5.00	600	120	300	*

* A quantity of 1,410 lb. seed pods of groundnut strains TMV. 3 and 250 lb. of castor strains TMV. 2 will be despatched during the second week of July.

(iii) *Tractor hiring scheme.*—During the period, 87 acres were ploughed and 12 acres harrowed by hiring and an amount of Rs. 1,027 was realised by way of hire charges. The coverage is low due to the tractor falling sick frequently and non-availability of spare parts.

(iv) *Comprehensive coconut nursery scheme.*—This is the fourth year of the scheme. During the period, 40,000 seed nuts were procured from reputed centres in Edakkanad and Vaniyam-badi at 20,000 nuts each for Tindivanam and Padalam Centres. They were planted during the last week of July at Tindivanam and third and fourth week of August 1960 at Padalam. A total of 16,197 and 11,477 seednuts germinated ensuring a germination percentage of 81 and 57 at Tindivanam and Padalam Centres respectively. The germination was poor at Padalam consequent on heavy unprecedented rain of nearly 24 inches during the first 20 days of November. A total of 19,577 seedlings were distributed from both the centres. The procurement of 60,000 seednuts 30,000 each for Tindivanam and Padalam Centres for 1961-62 season was completed.

(v) *Cashewnut development scheme.*—The scheme was started on 15th October 1959 with the posting of Horticultural Assistant. Details regarding the quantity of seeds and seedlings distributed are given in the table below :—

	LB.
(i) Quantity of seeds procured	23,220
(ii) Quantity of seeds issued for loan purpose.	1,166
(iii) Quantity of seeds issued for general purposes.	9,106
(iv) Quantity of seeds supplied to the officers of other States.	12,140
(v) Number of seedlings distributed	1,725

(vi) *Co-ordinated Manurial Scheme for groundnut in the Madras State*—(a) *Simple manurial demonstration trials*—1961 summer.—A pilot scheme for demonstrating the use of NPK fertilisers in South Arcot district on irrigated groundnut was initiated. The trial with two treatments, "No manure" and "NPK" fertiliser with a basal dressing of 5,000 lb. farm yard manure was laid out in 12 centres. The NPK treatment was designed to supply N as ammonium sulphate to supply 15 lb. N, P as superphosphate at 30 lb. P_2O_5 per acre, and K as muriate of potash at 45 lb. K_2O per acre. In the majority of centres, NPK treatment registered 3 to 78 per cent increase over control.

(b) *Simple fertiliser trials on groundnut (rainfed).*—To find out the effect of fertilisers on groundnut, simple fertiliser trials on rainfed groundnut were laid out in 11 centres of Tindivanam taluk with the following treatments :—

No manure, cattle manure at 10,000 lb. per acre, NP, NK, PK and NPK (N at 10 lb. per acre in the form of ammonium sulphate, P at 20 lb. in the form of superphosphate and K at 30 lb. in the form of muriate of potash). The season was late and unfavourable due to the absence of rain during flowering and growth period and excessive continuous rains during later stage of the crop. Treatments cattle manure, PK and NP recorded higher yields than the rest in most of the centres.

(c) *Complex manurial trials.*—To fix the optimum doses and combination of nitrogen, phosphoric acid and potash for the rainfed groundnut crop a comprehensive trial with 27 treatments with and without a basal dressing of cattle manure at 5,000 pounds per acre was laid out at the Agricultural Research Station, Tindivanam during 1960-61 rainfed season, in a confounded design. Three levels in each of N, P_2O_5 and K_2O viz., N at 0, 15 and 30 lb. per acre and P_2O_5 and K_2O at 0, 20 and 40 lb. per acre were included. The yield trends indicated the superiority of treatments with low N and high dose of potash both in basal and non-basal dressing of cattle-manure.

V. *Miscellaneous*—(i) *Manures.*—One hundred and twenty-five tons of cattle-manure and 180 tons of compost were produced.

(ii) *Paddy.*—Strain TKM. 6 was raised in an area of 2.62 acres which recorded an average acre yield of 1,780 lb. grain and 3,080 lb. straw. The yield was poor due to continuous wet weather resulting in unprecedented heavy rainfall of 21 inches during the first 18 days of November, when the crop was in advanced maturity stage.

(iii) *Seed distribution.*—The following quantities of seeds and plants were distributed during the period :—

Groundnut pods	4,008 lb.
Groundnut kernels	294 "
Gingelly	1,722 "

Caster	245 lb.
Paddy TKM. 6	3,577 "
Cholam Co. 19	220 "
Lab—Lab	30 "
Gliricidia seeds	15 "
Sesbania seeds	10 "
Bendai	5 "
Kapok	70 "
Gliricidia cuttings	4,000 Nos.
Gliricidia seedlings	26,600 "
Pungam seedlings	200 "
Tomato seedlings	200 "
Kapak seedlings	300 "
Cassia seedlings	450 "
Bassia seedling	1,176 "
Neem seedlings	200 "

VI. *Benefits of research to ryots.*—A high yielding bold-seeded semi-spreading selection, A.H.6719 suitable for snack purposes was released as strain TMV.6. Thirteen high yielding selections, comprising five of the spreading and four in each of the semi-spreading and bunch varieties were tested in 38 centres in the districts where they recorded an average increase of 37.5 to 40.2 per cent in the case of spreading and semi-spreading and 10.8 per cent in the case of the bunch over the local spreading and bunch varieties. A spreading selection A.H.6885 consistently superior to all the three standards in three years of yield trials at the station and recording an average increase of 37.9, 16.0 and 25.6 per cent over local and strains TMV.1 and TMV.3 respectively was multiplied and issued for trials in the districts during 1961-62. Bunch selection A.H. 6875 and spreading selection A.H.6888 that are economic in three years of yield trials at the station will be multiplied during 1961-62. The strains released are capable of giving increased yields of 25 per cent over the local varieties on a moderate estimate. Despite adverse season, a total quantity of 12,854 lb. seeds of improved strains of the three major oilseed crops of the State was distributed both from the station and the zonal nucleus Seed Farm Stock. They are capable of spreading in an area of 522 acres at the outset and a greater area under natural spread in due course. This would result, on a moderate estimate, in an additional production of 29,020 lb. of seed valued at Rs. 9,700.

(9) *Agricultural Research station—Paramakudi—Research—Paddy.*—The trials conducted under semi-dry conditions failed due to absence of rains and absence of irrigation facilities.

Pureline selections—1. *Pulithipiratti.*—The sixty-four selections, though the germination was fairly good, failed to come up well due to non-receipt of rains. The same trial was laid out under wet

condition. But as the seedlings were affected very much by the floods, the seedlings failed to establish.

2. *Kuliadichan.*—Thirty single plants failed to come up satisfactorily when tried under semi-dry condition. Hence, when these were repeated under wet condition, the seedlings failed to establish as the seedlings in the nursery state were effected by floods.

3. *Banu.*—The trial with four selections was a failure when tried under semi-dry condition. When tried under wet conditions, though the plants came up well in the beginning the crop dried up at the flowering stage due to absence of rains.

4. *Varigarudan Samba.*—The yield trial of Varigarudan Samba with six selections with one standard was not successful due to unfavourable season. Only seed material was collected for further continuance.

5. *CO. 13 Series.*—The yield trial with CO. 13, TKM. 6, 6,517 and 6,522 though harvested successfully did not give significant results.

Miscellaneous experiment.—The observation trial conducted during the year under semi-dry condition revealed that the treatment 'Broadcasting' paddy seeds at 80 lb. per acre whether soaked or unsoaked has given the maximum acre yield.

Dry land crops—K. 3 Cholam.—K.3 Cholam crop was raised in an area of 50 cents. The ear formation was uniform and satisfactory.

Cumbu.—K.1 Cumbu and CO. 2 Cumbu were grown in 95 cents and 40 cents respectively. The growth and yield of K.1 cumbu were found better than CO. 2 cumbu.

TMV.2 groundnut.—TMV. 2 groundnut crop was sown in an area of 6.83 acres. The crop suffered a little in the beginning for want of rains but later the crop pushed up in growth on receipt of showers. The average acre yield obtained was 262.591 kilograms.

Ragi.—K. 1 ragi and CO. 1 ragi were sown in an area of 36 cents and 28 cents respectively. The germination was very poor proving the unsuitability of ragi crop to this type of sandy soil.

Gingelly.—An area of 0.71 acres under TMV. 2 and 0.83 acres under TMV. 3 gingelly was grown. The acre yields obtained in TMV. 2 and TMV. 3 were 81.775 kilograms and 129.520 kilograms respectively.

H. 85 horsegram.—The variety H. 85 horsegram was grown in an area of 6 cents. The crop gave an acre yield of 71.816 kilograms.

Varagu trial.—The trial with CO. 1, P. 1 and local varagu was tried each in 3 cents as observation plots. The trial was affected due to stagnation by floods. The acre yield of grains obtained in CO. 1, P. 1 and local varagu were 267 lb., 167 lb. and 233 lb. respectively. The superiority of CO. 1 variety than the rest, confirmed the previous years' results.

Vegetable—Bendai.—An area of 48 cents was raised with bendai crop. The fruit formation was satisfactory. A total quantity of 33 lb. of seed was obtained during the period under report.

Snake gourd and bitter gourd.—An area of 5 cents and 2 cents in snake gourd and bitter gourd respectively was raised. But unusually the snake gourd crop was a complete failure and fruit formation in bitter gourd crop was unsatisfactory. A total quantity of 1-361 kilograms of seeds was obtained in bitter gourd.

Cluster beans (CP. 380).—The variety (CP. 380) was grown in an area of 48 cents. The growth and vigour of the crop were luxuriant and the pod formation was also satisfactory. A total quantity of 36-572 kilograms of cluster beans seed was obtained during the period.

Fruits and layers.—A total quantity of 243-553 kilograms of fruits comprising mangoes, guava, malta and seveli lemon and **Papaya fruits, etc., 260 No. of plantain fruits and 1,114-996 kilograms of tapioca and 22-680 kilograms of sweet potato tubers and 641 No. of drum-stick pods were produced and sold.** Besides the above 29 years of Malta-lemon and 509 cuttings of Jaffna murungai were distributed. Though the flowering was normal in all the mango trees of the station, the fruit production was unsatisfactory this year due to seasonal conditions.

Organic manure.—A total quantity of 109 tons of organic manure comprising of farmyard manure, compost and green manure was produced and applied to the fields on the station.

(10) Central Farm—Coimbatore.

Season and rainfall.—There was a total rainfall of 31-76" in 59 rainy days as against a normal rainfall of 21-08" on 40 days (average of past ten years).

The south-west monsoon rains were in the month of July were helpful for taking up sowings of dry land crops and for preparing nurseries in wet lands. In August there was no rainfall and in September there was 0-59" rainfall and these rains were inadequate to the dry crops and the dry land crops were stunted in growth and failed in many fields. In wet lands the paddy crops suffered a great deal for want of timely and enough irrigations as there was no water available from channel. During three drought

period pump sets were put in full swing for lifting water to garden land crops. In October 1960 there was a heavy rainfall of 7-99" and these rains have caused damage to standing crops. MCU. 1 cotton, castor, etc., especially in Field Nos. 60-A, 54, 59-A, 59-B, 59-C nearly to tank-bed were submerged in flood for a number of days. In November also a heavy rainfall of 7-44" occurred and this was adverse to garden land crops like cotton and cultural operations were delayed and the sowings in dry lands were also delayed. In wet lands the harvest of CO. 13 paddy crop was delayed and the yields were affected as the grains were found germinating on the ears before harvest. In December there was no rainfall and this was not favourable to dry land crops as they were stunted in growth. But the dry weather during this period was favourable for the post-harvest operations of paddy, ragi, and cumbu. In January there was a rainfall of 1-29" and in February there was 0-46" and in March there was no rainfall. The hot weather during the period facilitated the harvest of red gram and cholam in dry lands and picking of kapas in garden land and dry lands. During the months of April and May there was meagre rainfall and the water table in wells have gone down and hence pump sets had to be worked day and night for lift irrigation in garden lands. In June, there was a heavy rainfall of 16-24" which caused damage to standing crops of cholam, ragi and groundnut. But the rains were favourable for taking up preparatory cultivation in garden lands and dry lands. Generally the seasonal conditions were not favourable for normal cropping during this year.

Extent of the farm.—The total area cultivated during the year excluding orchard and paddock was 206-70 acres. This comprised of 68-94 acres of dry land, 73-01 acres of garden land and 42-35 acres of wet lands. Out of this, an extent of 63-38 acres was devoted to the experiments and schemes under the different specialists and the rest of the area was utilised for seed multiplication, production of fodder and green manure.

The area under orchard in the beginning was 9-40 acres and later on by addition of fields 57A, 57B, 59A, 59B, 59C, 60, 60A, 60B, 60C and 61 the area under orchard increased to 21-78 acres.

Crops grown.—The main crops grown were paddy, cholam, ragi, cumbu, cotton, fodder crops, sugarcane, banana and oil seeds. P.216 F cotton, banana, sugarcane and oilseeds were grown under experiments.

Paddy.—Twelve strains (CO. 2, CO. 13, CO. 19, CO. 25, GEB. 24, CO. 29, CO. 30, SR. 26B, ASD. 5, ASD. 11, TKM. C and BAM. 3) were grown and multiplied in 44-25 acres in Central Farm and a total quantity of 41,669 lb. of improved paddy seed was produced. This will aid in the increased production of 184½ tons of rice by the distribution of improved seeds. Besides this a total quantity of 39,792 Kg. paddy grains were obtained.

Cholam.—Five strains of cholam, viz., CO. 1, CO. 11, CO. 12, CO. 18, CO. 19 grown in 37.14 acres gave a total yield of 13,344 lb. of seed and 9,070 lb. of grain. 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 24.66 acres and a total yield of 37,209 lb. of ragi seed and 39,252 lb. of grain were obtained.

Cumbu.—Three strains of cumbu CO. 4, CO. 3 and X. 3 were grown in an area of 9.91 acres. The total yield of 4,796 lb. of seed and 980 lb. of grain were obtained.

Cotton.—MCU. 1 cotton was grown in garden lands in 22.82 acres and the total yield of 15,177 lb. of kapas was obtained.

P. 216 F. cotton was grown in wet lands, in rice fallows in 1.00 acre for Entomology Experiment and Post-graduate students' experiments.

K. 6 Pandian and K. 5 were grown in 10.21 acres. K. 5 was grown under Meteorology experiment.

Perennial grass.—Cumbu, Napier grass, Guinea grass, water grass and Blou buffel grass were grown in a total area of 13.04 acres to supply green fodder for the milch animals and young stock. A total quantity of 584,117 lb. of grass was obtained.

Lucerne.—This was grown in 0.97 acres and a total yield of 42,384 lb. of green fodder was obtained.

Maize.—It was grown for fodder in 15.38 acres. A total quantity of 202,241 lb. of succulent green fodder was obtained.

Pests and diseases.—There was an incidence of jassids and earhead bugs on paddy and these were effectively controlled by dusting BHC. 10 per cent. Similarly earhead bug on cholam was noticed, 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 Folidol F. 605 at one oz. in 13 gallons of water. In Grapevine the incidence of downy mildew, powdery mildew and anthracnose were observed and these were effectively controlled then and there. Similarly pests observed in vegetables, annona and guava plants were also controlled by applying suitable pesticides and fungicides.

Livestock.—There were 93 work animals and one breeding bull at the beginning of the year. Two animals were auctioned as they were old and one animal expired due to disease and at the close of year there were 45 pairs of work animals and one breeding bull.

College dairy.—Though dairy and poultry are run on commercial lines, they were mainly intended for imparting agricultural instruction for the students of Agricultural College and Research Institute and for the Young Farmers who underwent training. The dairy continued to be under the administrative control of the Superintendent, Central Farm, and the technical control was vested with Professor of Animal Husbandry. The strength of the herd was 112 at the beginning and at the close was 113. The change in strength of the cattle was due to 34 calvings and 16 disposals and 17 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 :—

				Average yield per day.
				LB.
1	Sindhi (Hosur)	..	..	10.55
2	Sindhi (Graded)	..	..	9.92
3	Gir	..	..	8.37
4	X-breed	..	..	11.30
5	Murrah buffalo	..	..	9.7

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 55 services during the year. The rest of the cows were impregnated by artificial insemination.

More Milk Day.—More Milk Day was celebrated at College Dairy on 13th April 1961, i.e., on Tamil New Years' Day by distributing milk to expectant mothers and poor children in the College Estate.

Poultry.—At the commencement of the year there were 437 numbers of poultry birds of the four breeds. At the end of the year the stock position of the four breeds was 399. There were 297 additions by hatchings, 6 receipts by purchase, 130 deaths and 157 disposal by sales and transfers and 54 by auction. The breeds maintained were (1) Rhode island red, (2) White leghorn, (3) Barred Plymouth Rock and (4) Black Leghorn.

Egg production.—There were 74 eggs on stock at the beginning. During the year 22,229 eggs were received and disposed, 20,068 numbers by sale as table eggs and setting eggs and 1,402 eggs fed to stock and 729 numbers issued for incubation. The balance carried over to the next year was 104. The average egg yield was as following :—

				Average yield per year.
				NOS.
	Rhode Island Red	..	..	167
	White Leghorn	..	..	142
	Barred Plymouth Rock	..	..	128
	Black Leghorn	..	..	146

Coconut nursery.—The Administrative Control of Coconut Nursery was continuing under the Superintendent, Central Farm, up to 31st March 1961. A total number of 24,570 quality coconut seedlings were supplied to the Agriculturists up to 31st March 1961.

(11) *Groundnut Research Station, Pollachi.*

Season and rainfall.—Sowing rains in the 1960 cropping season were received in April 1960, which were adequate for completing the sowings. Rains were received also in the first week of May 1960 subsequent to which there was a spell of dry weather during the flower formation period.

The south-west monsoon set in with heavy rains in the third week of June 1960 which continued up to the first week of August 1960. A total rainfall of 383.3 m.m. was received during the period June to August 1960. With the receipt of the south-west monsoon rains, the groundnut crop revived from the effect of drought.

The north-east monsoon broke out in the second fortnight of October 1960 and was very active till the third week of November 1960. A rainfall of 568.3 m.m. was recorded during October-November 1960.

The 1961 summer was quite severe and prolonged, the months of January to April 1961 being practically dry. Sowing rains were received very late, namely, in the month of May 1961. However, the south-west monsoon set in very early this year and heavy rains amounting to 400.2 m.m. were recorded in the months of May and June 1961. The condition of the crop during the current season is good.

Summary of the work done—

I. *Scheme for the improvement of the Pollachi Red Groundnut in the Madras State*—(i) *Introduction and acclimatization of varieties.*—The varietal collection numbering 190 was raised and studied during the 1960 season. A total of 131 varieties yielded higher than the local and 70 varieties higher than strain TMV.2. Thirty varieties gave higher shelling out-turn than the local, while 90 varieties shelled higher than TMV.2. The entire collection along with a fresh collection numbering 55 received from other Indian States has been raised during the 1961 season. The crop is on the field.

(ii) *Collection and testing of varieties from other parts of the State, India and the World.*—The scattered block trial of the three bunch selections A.H. 4,218, A.H. 6,179 and A.H. 6,279 were laid out for the third year in succession during 1960. All the selections gave significantly higher yield than the local and

were on a par with TMV.2. The yield increases were 58.2 per cent, 62.9 per cent and 51.2 per cent in the case of A.H. 4,218, A.H. 6,179 and A.H. 6,279 respectively. With regard to the qualitative characters, A.H. 4,218 and A.H. 6,179 were superior to both the local and TMV. 2. The trial has been repeated during the current season and the crop is on the ryots' fields.

(iii) *Selection of Single Plants from Ryots' bulk and testing them for yield and quality.*—Eleven mass selections were under comparative yield trial in two series during 1960 season. The trial revealed no superiority of the mass selections over the local unselected bulk with regard to both the yield and qualitative characters. The results so far obtained from the trial of mass selections for the past four years indicate that mass selection as a means of crop improvement did not offer much scope in the Pollachi red groundnut. Therefore this item of work has been discontinued during the extension period of the scheme.

Two hundred and seventy selections were put under replicated row tests during the 1960 season out of which 39 selections gave significantly higher yields than the local and these were carried forward for seed multiplication in 1961. One hundred and seventy-eight selections from the seed multiplication and eighteen selections from the row tests of 1960 have been put under replicated row tests in two series during current season.

Out of 181 selections under row tests of 1960, 108 out yielded the adjoining control and ninety of them have been put under seed multiplication during 1961.

(iv) *Hybridization.*—The progenies of earlier crosses were raised and studied and fresh crosses effected between Pollachi red and eight selected parents during the 1960 and 1961 seasons. A total of 33 and 133 selections made earlier from progenies of crosses were included in row tests and replicated row tests respectively.

II. *Scheme to run six zonal Nucleus Seed Farms of improved strains of Groundnut and Castor.*—This is the final year of 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 improved strains of groundnut on a Zonal basis for further multiplication in the districts. The targets and actual production of the seeds of the improved strains are furnished in the following table:—

Strain.	Target of production in lb.	Area sown in acres.	Actual production in lb.
(1)	(2)	(3)	(4)
TMV. 2	17,500	35.00	18,480
TMV. 3	7,350	10.00	5,490
TMV. 4	3,375	5.00	2,240
Total, ..	28,225	50.00	26,210

III. *Scheme for Co-ordinated Manurial Trials on groundnut in Madras State.*—This is the first year of the working of the Pollachi Centre of this scheme sanctioned in G.O. Ms. No. 2823, Food and Agriculture, dated 29th July 1959. The scheme has for its objective the conduct of simple and complex manurial trials on groundnut in the ryots' fields and the Research Stations to demonstrate the advantages of manuring and to make possible the recommendation of effective and economic combinations of fertilisers to the crop. The work done under the scheme at this centre during the year is presented below :—

(i) *Demonstration plots.*—The effect of N.P.K. fertilizer mixture (15 lb. N, 30 lb. P. O₅ and 45 lb. K O) on the crop was under study in 12 demonstration trials, laid out in the Lower Bhavani Project area during 1960-61 irrigated season. An average increase in yield of 16 per cent was recorded by the manured plots over the control.

(ii) *Simple fertilizer trials on rain-fed groundnut in Pollachi tract.*—The effect of NPK fertilization in various combinations was under trial in 12 trial plots laid out in representative centres scattered over the tract. The crop is in progress.

(iii) *Complex manurial experiment.*—This experiment which includes all possible combinations of NPK fertilizers at different levels has been laid out at the Groundnut Research Station, Pollachi, the crop is on the field.

Seed distribution.—The following quantities of seeds were distributed during the year :—

Name of the strains.	Quantity of seeds distributed.	Average percentage of increased production.	Estimated area covered in acres.	Additional production in tons.	Monetary gain in rupees.
(1)	(2)	(3)	(4)	(5)	(6)
TMV. 2	13,800*	20	85.00	7.5	5,250.00
TMV. 3	2,740	20	18.00	2.0	1,400.00
TMV. 4	1,220	20	8.00	1.0	700.00
Total	17,560	60	111.00	10.5	7,350.00

* Includes 880 lb. of nucleus seeds produced at the Groundnut Research Station, Pollachi, transferred to the Zonal Nucleus Seed Farm Scheme.

(12) Gingelly Research Station, Karur.

Season and rainfall.—During the year a quantity of 349.77 m.m. of rainfall was received. The distribution of rainfall was abnormal, as half of the total amount was received during the month of November while in the other months the rainfall was low and scanty. The rainfall received during the month of July was helpful in taking up the sowing in time. But after that a dry

period prevailed for nearly 6 weeks. During this period the young gingelly crop was severely affected resulting in stunted growth. The short duration crop started flowering one month after sowing and the rains received during the end of August, were beneficial to the short duration types to a certain extent, but it was not of much help to the local and long duration varieties which started drying up. The rainfall was sporadic and scanty in September and October. During this dry period the short duration varieties ripened quickly and was harvested early in November before the onset of continuous wet weather. The yield obtained was only 25 per cent of the normal. The long duration crop failed almost completely due to the inadequate rainfall during its growth and blooming period. Furthermore the crop was subjected to the severe attack of phyllody disease and wilt during the continuous wet weather in November. The fields presented a scorched appearance with dried up plants in varying stages of wilt and phyllody. The crop came to harvest in December. The yield was very poor in the long duration crop.

The rainfall received during the summer was 192.30 m.m. on 9 rainy days as against 94.50 m.m. received on 8 rainy days during the last year. The days were very hot and dry and the summer was very severe. The gingelly crop was adequately irrigated and the yield obtained was normal.

Summary of work done—Scheme for intensive breeding of gingelly.—Three strains from other States, one from Kanpur, Uttar Pradesh and two from Beruhampore, West Bengal were put under yield trials for the second time. The yield differences were not significant. Three varieties from different centres in Tiruchirappalli district were compared with the local sesamum for the second time. All the three varieties recorded significantly increased yields over the local. Three strains from Tindivanam were also tested for the second time in another yield trial, along with the local. The strains TMV-1 and TMV-3 were found to be significantly superior and recorded higher yields than the local. Nine other district varieties were compared with the local sesamum for the first time and eight of them recorded significantly higher yields than the local. Two mass selections were put under yield trial for the first time along with the local. The short duration mass selection from Musiri was found to be significantly superior while the other was on par with the local.

In all the above five trials, the short duration varieties and strains recorded better yields than the local long duration variety. This failure of the local was due to the abnormal and adverse seasonal conditions that prevailed during the period.

Six hundred and fifty single plant selections were tested in row trials and among them 226 selections were found promising. One hundred and twenty-eight varieties and 48 types were raised

and studied during the period for their morphological characters. Among the varieties, 92 recorded increased yields over the local. Twenty-two new varieties were collected during the year.

Ten crosses and ten reciprocal crosses were attempted between the local and ten selected parents. The progenies (F-1^a, F-2^a, F-3^a,) were raised and studied. From the progenies, 651 selections were made for further trials. The percentage of natural crossing in *Sesamum* was found to be 6.4 per cent in S.I. 255 and 5.4 per cent in S.I. 1088. The sterile hybrid between *Sesamum orientale* and *Sesamum laciniatum* was treated with 0.05 per cent colchicine and setting was induced.

Scheme for co-ordinated manurial trials on groundnut.—Twelve centres were fixed for laying out demonstration plots of NPK fertilizer on groundnut in the new project area of Thanjavur district, viz., Pattukkottai Division. A mixed NPK fertilizer (N to supply 15 lb. of N per acre, P to supply 30 lb. of P₂O₅ per acre and K to supply 45 lb. of K₂O per acre) over a basal dressing of 5 cart-loads of cattle manure is being compared with no manure. The plots were laid out and the manures were applied departmentally. Other operations like sowing, weeding, etc., were attended to by the ryots. Studies on growth were taken up and the plots manured with NPK fertilizers were found to be better in growth than the control plots both by measurement and appearance. Harvesting of the crop was taken up and was in progress.

Plots have been laid out at the Gingelly Research Station, Karur, for the lay-out of the comprehensive manurial experiment on groundnut under rainfed conditions.

Seed production and distribution.—The following quantities of gingelly seeds were produced and distributed during the year:—

Strain number.	Quantity produced in k.gms.	Quantity distributed in k.gms.
(1)	(2)	(3)
TMV-1	288.0	..
TMV-2	118.5	255.5
TMV-3	116.8	18.0

(13) Castor Research Station, Salem.

Scheme for the production of Hybrid Castor and for evolving short duration high yielding castor strains.—The scheme which is to run for a period of five years for the production of commercial castor hybrids and short duration varieties was started during the year and was functioning at Salem. The collection of inbreds was made and new varieties numbering over 190 were raised for study and isolation of desirable types.

With a view to spot hybrids with the maximum expression of heterosis, 102 crosses were effected between selected parents. Some of the hybrids of castor crosses which were tested in yield trials, were found to be potential yielders.

In order to evolve short duration varieties of castor, 72 crosses were effected between the strains and other inbreds and short duration American, Italian and South African varieties. Selection of useful single plants was also made from a study of progenies of earlier crosses made at Tindivanam.

To introduce masker gene characters like spininess of stem or pigmentation of capsules for easy identification, 16 crosses were effected between the strain TMV. 1 and TMV. 2 and four selected parents.

(14) Pomological Station, Coonoor.

Research—(a) Apple.—Among the 44 different varieties and selections at the Pomological Station, Coonoor, 30 varieties and selections bore fruits during the year. The crop in general has been very satisfactory during the year. The growth performance of home grafted plants of the four varieties, resistant to warm winter conditions, introduced from Kulu Valley and planted at the station during February 1960, has not been very encouraging. The quince apple plants planted in 1956 have developed a moderately good crop during the third year of their bearing. In the apple rootstock trial for Rome Beauty with four different Merton Rootstocks M. 778 and M. 779 have recorded the maximum tree growth and fruit yield respectively over the others. In respect of resistance to woolly aphis pest, though the Merton rootstocks have been found to be comparatively resistant by themselves than the crab, their influence to the scion, was not felt to any extent. Among the three Malling Merton rootstocks introduced during 1958, the rootstocks M.M. 112 continued to be vigorous in respect of both growth and sucker production. All the three types of Malling Mertons, viz., M.M. 110, M.M. 112 and M.M. 113 have been found to be highly resistant to woolly aphis.

(b) Plum.—The cropping in plum, except the early bearing varieties has been very poor due to heavy and continuous rains in the flowering period. In the rootstock trial for the choice varieties or plum, viz., Gzar and Gaviota, with seedling rootstock of plum varieties and common peach, though the disparity between stock-scion growths resulting in the bottle neck joint was observed to a greater extent with the common peach seedling rootstocks, their influence on growth and yield of fruits on the scions was the maximum than the seedling rootstock of plum varieties. The common peach seedling rootstocks has continuously, proved their superiority over others in respect of tree growth and crop yield.

In the trial to break the dormancy of shy bearing late varieties of plum with Sandolin 'A' (0.5 per cent) and Euphyton oil (3 per cent) the observations during the year have confirmed the earlier findings. During the year the trees sprayed with Sandolin 'A' broke dormancy by about 5 to 15 days earlier than the control and gave increased yields ranging from 22.8 to 220 per cent over the control in only four varieties, viz., Shiro Abundance, Wright's Late, and Kelsey while in respect of Combination and October-Purple the sprayed trees have given depressed yields than the control. The control trees have given more yields by 43.7 per cent and 18.9 per cent respectively. The sprayed trees have put on more vegetative growth at the expense of fruit production. In the Sandolin 'A' spraying trial on Gaviota, initiated during the year, the sprayed trees broke dormancy by about eight days earlier than the control and have given an increased yield of 113.6 per cent over the control. In the trial to find out the effect of Sandolin 'A' spray by varying the periods of spraying carried out on Shiro during the year, the observations were in favour of spraying during the third week of January. The delayed spraying had no effect in inducing earlier bud break and in increasing the yield. It was observed even from the first year of this trial that yield in Shy bearing late varieties. The increase in yield is attributable to the coincidence of the flowering of Shy bearing late varieties with that of pollinisers.

(c) *Peach*.—In the trial with Red Shanghai and Shangai seedling peach varieties as scions and three differently aged common peach seedlings as rootstocks, the youngest age group, viz., eight months old common peach seedling rootstocks recorded the better tree vigour and yield with both the varieties. The yield in early and mid-season varieties on peach has been comparatively good during the year, while in the late varieties the yield was very poor as in the previous year. Of the three plants of the late variety from Dun Sandle Estate, only a single fruit was developing on one tree. Though the growth performance of this variety has been good the cropping has been very poor from the year of their bearing in 1958.

(d) *Pears*.—The yield of early varieties of pear, namely Beurre Giffard, New Pear, Leconte and four selections from Kotagiri has been comparatively better than the previous years. An orchard average of about 25 pounds per tree has been recorded. An estimated crop of about 40 lb. per tree during the year in the variety Kieffer is recorded to be below normal. The low yield is attributable to the unfavourable seasonal conditions that prevailed during the blossoming period. The varieties William and Jargonelle have completely failed during the year, while that of Beurre Hardy, Marie Louise, Wintercole and selections from Kodaikanal and Kalhatti continued to remain in their pre-bearing age.

(e) *Persimmon*.—The varieties Dai Dai-Maru, Tenanashi and Unnamed which are in full bearing age were found to carry an estimated orchard average of about 15 lb. per tree. The single tree of the variety Hachiya failed to crop during the year. The varieties Hachiya and Raw Eating, planted in 1956 set an average of six fruits during the year. However the fruits were not carried to maturity as they have dropped prematurely. The monthly inarching trials of Persimmon on *Diospyros lotus* seedling rootstocks initiated from December 1960, was in progress during the year. The inarches made in the first two batches were separated after 5 months of operation. A success of 75 per cent 'Take' was recorded in the first batch of inarches made during December 1960.

(f) *Cherimoyer*.—In the trial to study the comparative performance of grafts and seedlings of Cherimoyer the seedlings have recorded better growth and yield than the grafts. However, the yield of fruits has been very poor. During the year single graft of the selection from United States of America bore an abnormally big sized fruit weighing 7 lb. The fruit was about 10 inches breathwise and about 14 inches lengthwise. The tree bore 12 fruits which weighed on an average about 1½ lb. each. Only a stray fruit set has been recorded on the different selections at the station during the period under report.

(g) *New introduction*.—During the period under the report four varieties of Chicory and *Casuarina stricta* from the Systematic Botanist and Associate Professor of Botany, Coimbatore, were introduced newly. Of the introduction made earlier, the beans types from Hungary, Capsicum from Srinagar, Soya Beans from Nainital, Tomato types from United States of America, Chicory varieties from Holland, Olive from Italy, Chinese Gooseberry from Australia, Apple Malling Merton rootstocks from England and *Glycne javanica* from New Delhi have been given indications of promise. The other introductions such as West Indian Cherry, Mussorie garlic, Lovage, *Artemisia pontica*, *Ammi visnaga*, Carica hybrids and Anab-E-Shani grapes failed to perform satisfactorily at the station.

(15) Kallar Fruit Station.

(a) *Annonas*.—Nineteen hybrids in four parental combinations were found to be non-gametic in origin.

In the Custard Apple rootstock trial, the Bull's Heart showed its superiority over other rootstocks, but the annonas in general were not satisfactory.

(b) *Citrus*.—Out of the 23 seedling and clonal progenies which have been assembled the descriptions of 22 types were recorded.

In the rootstock trial two grafts of Wynaad mandarin on sweet lime and two grafts of Kallar Mandarin on jamberi and one graft on Gajanimma came to bearing. The quality was poor.

In the hybridisation trial, three progenies of the combination Malta Lemon × Triumph Grape fruit came to bearing and were found to be of non-gametic origin.

(c) *Jack*.—In the rootstock trial a graft on Rudrakshi bore 581 lb. while two grafts on Jack averaged 355 lb.

(d) *Mangosteen*.—The growth performance of the progenies is under study.

(e) *Pineapple*.—Seventeen seeds were obtained in crosses between Kew × Mauritius. Six seedlings resulting from the cross Mauritius × Kew are being tended.

(f) *Patchouli*.—The Patchouli has shown promise as an inter-crop. Stem cuttings of 6 inches and 10 inches length sprout well when planted during March to June.

(g) *Vetiver*.—Thirty-five plants have been obtained from planting 102 slips.

(h) *Other introductions*.—The performance of white sapota, ranwolfia, meyer lemon, tahiti lime and Tolu were satisfactory.

(16) *Burliar Fruit Station.*

(a) *Durian*.—The rootstocks of durian and *Cullenia excelsa* show compatibility with durian scion.

(b) *Jack*.—Out of 51 selections and introductions a graft from Thyagarayanagar bore for the first time after 9 years.

The propagation trials by cincturing was not successful.

(c) *Passion Fruit*.—Eighty-five hybrid seedlings of the combination, *P. oudrangularis* × *P. edulis* var *Flavicarpa* have been obtained.

(d) *Pummele*.—The selfed progenies are in the pre-bearing stage.

(e) *New introductions*.—The performance of cardamom cultures, cardamoms from Bombay and *Cinnamomum iners* was satisfactory.

(f) *Bread Fruit*.—The trial on inducing sukering by wounding of roots did not give positive results.

Supply of Plants.

	Number.	Area covered.	Monetary value.
(1)	(2)	(3)	(4)
Fruit plants ..	22,138	220.00	A total of 155 tons of produce is estimated to become available when the plant come to yield valued at Rs. 62,000.
Ornamental plants ..	676	1.00	
Vegetable seedlings ..	984	0.20	
Spices ..	4,980	60.00	
Other economic crops ..	72,869	31.00	
	<u>101,647</u>	<u>317.20</u>	

Seeds.—

	Quantity sold.	Area covered in acres.	Monetary value.
(1)	(2)	(3)	(4)
Seeds of fruit plants ..	14 lb. 9 oz.	5.50	A quantity of 15 tons of produce valued at Rs. 6,000 is expected to be produced.
Seeds of spice plants ..	16 lb.	6.00	
Vegetable seeds ..	7,489 lb.	7.00	
Green Manure seeds ..	42 lb.	1.25	
Others (9900 Nos.) ..	12 lb.	10.25	
Total ..		<u>30.00</u>	

(17) *Fruit Research Station, Kanyakumari.*

The existing station did not have any regular programme of research work. Two items, namely (1) new introductions (of fruit trees) and (2) pruning trials in guavas are included in the approved Five-Year Programme of research work in force from April, 1961 but actually had not been communicated till the end of the year under report and hence a detailed report is not possible.

Indian Council of Agricultural Research Scheme—(1) *Varietal collection*.—During the previous year, mango stems of a single variety, Bappakkai, were sown for raising rootstock seedlings to be used in the propagation of 15 selected varieties at the Fruit Research Station, Kanyakumari.

During the year under report, 192 grafts were made from the selected trees in the existing plantations on seedlings of Kappakkai variety as rootstock. The grafts were making good progress and were awaiting planting.

Grafts of the mango varieties Alampur Baneshan, Suvarna-rekha, Kodur Hybrid 11/13, Himayuddin, Padiri, and Jehangir were obtained from other centres. The required number of grafts in these varieties were available for planting.

Studies on growth, flowering and fruiting qualities of the different selected varieties were initiated on the existing trees at the station. Data and observations were recorded periodically.

2. *Study of individual tree performance*.—Periodical observations were recorded in trees of the selected varieties in this study using a detailed proforma prepared for the purpose.

3. *Progeny tests*.—Three best trees in each of the nine varieties, viz., Neelum, Bangalora, Rumani, Pairi, Kalpad Khudadad, Surangudi, Dilpasand and Mulgoa were selected in the existing collections and 220 grafts were prepared in November, 1960. The grafts were making satisfactory progress and were awaiting planting.

4. *Trial of Poly-embryonic rootstocks.*—The required number of seed materials of the two poly-embryonic varieties, namely, Bappakkai and Olour were obtained from Kerala State and were sown along with stems of a local mono-embryonic variety, Zionpuram Kappai. The seedlings will be used for raising clonal progenies in the varieties Neelum, Rumani and Pairi in due course.

5. *Study of cultural practices.*—A total of 54 grafts were raised for this experiment on Kappakkai seedlings in November, 1960 in selected trees of the varieties, Surangudi, Neelum and Bangalora. The grafts were making good progress. Seven trees in each of Bangalora, Neelum and Pairi have been selected in the existing Fruit Research Station for undertaking a preliminary observational trial under this item.

6. *Fertiliser experiments.*—Forty-five grafts were prepared in selected trees of Neelum, Bangalora and Rumani using Bappakkai seedlings as rootstock. The grafts were making good progress.

7. *Biometric studies.*—The studies were initiated towards close of last year. The following work was carried out during the year under report :—

(a) *Sex-ratio studies.*—A study of sex-ratios of various varieties in different months of the year was commenced in August, 1960. A total of 1,54,187 flowers borne in 165 panicles in 22 varieties of mango were examined. There were considerable variations in the percentage of perfect flowers among the varieties. The percentage of perfect flowers was as high as 95 in August 1960 in Neelum while one per cent only was recorded in October 1960 in Kalkatchi. There were also interesting variations in sex-ratio in the different months.

Kalepad recorded 46 per cent of perfect flowers in March 1961, but three only in August 1960. Further studies are being continued for conclusive and reliable data. The period taken for complete opening of all flowers in a panicle ranged from 17 days in Bangalora, in nine days in Dilpasand. The maximum number of flowers noticed in a single panicle was 6,445 in the case of Roose and the minimum was 149 in Kalepad. Appreciable variation was also noticed in the percentage of perfect flowers produced from panicle to panicle, in the same month. Bangalora recorded one to 54 per cent in different panicles in the month of August 1960.

(b) *Shoot studies.*—To study the behavior of shoots which originated in different months of the year in relation to the growth in thickness and length and production of flushes and flowers, a total of 696 shoots were tagged in eight varieties at monthly

intervals from July 1960. The study indicated that a shoot should be more mature to produce flowers than to produce flushes. Among the shoots of the eldest group of shoots elected for the study, a maximum of 87 per cent produced new flushes while only a maximum of 50 per cent produced flowers. This indicated that a greater proportion of the shoots tended to be more active vegetatively than in the production of flowers. It was also noted that the elder a shoot the more is the chance for it to flower. The study also indicated that it required at least four months of growth for shoots to produce new flushes while at least seven months were required to flower.

(c) *Studies on duration of maturity of fruits.*—With a view to study the time taken from fruit set to full maturity, one tree in each of 17 varieties were selected and a total of 102 panicles were tagged. Only 35 panicles in eight varieties, viz., Bangalora, Neelum, Raspuri Nadan, Rasam, Roose, Surangudi and Mundappa bore fruits to maturity. It was found that, on an average, 88 days were required for fruit to become fit for picking. The duration, however, ranged between a maximum of 109 days in the case of Raspuri and a minimum of 84 days in Mundappa and Neelum.

Supply of plants :—

(i) *Number of fruit plants, etc., supplied for each kind of crop.*

Number of plants supplied in 1960-1961.

1. Mango	2,023
2. Guava	1,071
3. Pomegranate	205
4. Grapevine	437
5. Lemon	56
6. Miscellaneous	531
Total ..	4,323

(ii) *Sale of fruits—*

	M. TONNES.	Kg.
Quantities sold in 1960-61.		
1. Mango	5	477.5
2. Guava	3	730.5
3. Pomegranate	0	29.5
4. Grapes	3	87.5
5. Lemon	0	39
6. Sapota	0	688
7. Lime	0	2.5
Total ..	10	34.5

(18) *Sugarcane Research Station—Gudiyatham.*

Season.—The season during the period under report had been adverse and unfavourable as in the previous year. The rainfall was not equitably distributed. A total rainfall of 43.70 inches was received during the period under report. The rainfall received did not improve the underground springs and consequently the water-level in the 2 wells did not arise up to the usual levels obtained during normal years of seasonal rainfall. Severe drought conditions and acute water scarcity was experienced during the early periods of growth of the sugarcane crop which adversely affected the yield.

Experiments.—Four new Coimbatore seedlings of 1960 release were received from the Sugarcane Breeding Institute, Coimbatore. They were multiplied for taking them over to the varietal study plots during 1961-1962 season.

Seventy-four varieties were under trial in the varietal study plots of which 32 were under first year of study and 42 under second year of study under normal conditions of manuring and irrigation. Based on the yield, Juice quality and field habits of the varieties under trial in the month of December, the following 16 varieties were selected and promoted to the preliminary yield trial of early varieties:—Co. 1232, Co. 1234, Co. 1237, Co. 1246, Co. 1256, Co. 1261, Co. 1266, Co. 1271, Co. 1279, Co. 1288, Co. 1290, Co. 1304, Co. 1305, and Co. 1308.

Similarly based on the Juice quality data in the month of May, the following varieties were promoted to the Preliminary Yield Trial (late):—Co. 1241, Co. 1244, Co. 1267, Co. 1275, Co. 1283, Co. 1285, Co. 1287, Co. 1289, Co. 1301, and Co. 1303.

In the preliminary yield trial of early varieties, 7 varieties were under trial and were compared with Co. 419, Co. 449, and Co. 658. The yield differences were statistically significant. Co. 1223 was outstandingly the best yielder with 33.7 tons of canes per acre followed by Co. 1286 and 29.4 tons and Co. 419 with 29.0 tons per acre respectively. Co. 1260 has received the best Juice quality with 18.88 per cent sucrose and 13.55 per cent as followed by Co. 1254 with 18.73 per cent sucrose and 13.60 per cent. Co. 449 was equally good with 18.36 per cent sucrose and 13.28 per cent.

In the preliminary yield trial of late varieties, 8 varieties were under trial and compared with Co. 419 and Co. 449. Though the yield differences were statistically significant the yield in general of all the varieties was very poor during the year due to adverse seasonal conditions. However the variety Co. 1247 gave the highest yield of 29.0 tons followed by Co. 1273 with 27.2 tons and Co. 1259 with 26.9 tons of canes per acre. Co. 1253

recorded the best Juice quality of 17.30 per cent sucrose and 12.40 per cent ces as compared to 15.66 per cent sucrose and 10.00 per cent ces on the other standard Co. 449. This trial will be repeated for the 2nd year during 1961-62 seasons.

In the Main Yield Trial of Early varieties 6 varieties were under study and compared with Co. 419 and Co. 449. The yield differences were not statistically significant. However Co. 658 recorded the maximum yield of 39.17 tons followed by Co. 419 with 37.12 tons and Co. 740 with 36.80 tons of canes per acre. Co. 740 recorded the highest sugar per acre with 4.18 tons closely followed by Co. 1001 and Co. 785 with 4.36 and 4.33 tons per acre respectively.

In the Main Yield Trail of Late varieties 4 varieties were under study and compared with Co. 419 and Co. 449. The yield differences were not statistically significant. However the variety Co. 964 recorded the highest yield with 29.68 tons followed by Co. 449 with 29.45 tons of canes per acre as compared to Co. 419 with 26.04 tons of cane per acre. The yield in general in all the varieties during this season has been poor due to adverse seasonal conditions. Co. 1044 recorded the best Juice quality with 17.45 per cent sucrose and 12.50 per cent ces as compared to 13.13 per cent sucrose and 9.28 ces in Co. 419.

In the maturity observation plots of early varieties Co. 997 recorded the best Juice quality with 19.30 per cent sucrose and 13.44 per cent ces. The next best was Co. 740 with 18.53 per cent sucrose and 12.88 per cent ces. There was general deterioration in Juice quality in the month of May. Variety Co. 740 recorded the best Juice quality with 15.19 per cent sucrose and 10.53 ces. in the month of May. The peak maturity is obtained in all the varieties in the month of March.

In the Maturity observation plots of late varieties the maximum sucrose of 15.40 per cent and ces of 10.51 per cent was obtained in the variety Co. 1044 followed by Co. 449 with 15.33 per cent sucrose and 10.64 ces in the month of March. The maximum Juice quality was also obtained in the variety Co. 1044 in the month of May 14. 89 per cent 10.08 per cent ces followed by Co. 449 with 13.98 sucrose and 9.75 per cent ces. The Juice quality is seen to be the poorest in Co. 1022.

In the trial on the Response of Sugarcane to Phosphates, the yield differences were not statistically significant. However the plots supplied with 75 lbs. P₂O₅ all at planting by the placement method recorded the highest yield. The yield differences were not very much marked. As regards Juice quality also marked and wide variation was not noticed between the different

plots. Best Juice quality was however noticed in the plots manured with 75 lbs. P2O5 all at planting by placement method. However the Juice quality obtained in the plots where no P2O5 was applied was also almost equal to the plots where 75 lbs. P2O5 was given all at planting by placement method.

In the bulk observation plots to study the yield trend of the 2 standard varieties Co. 419 and Co. 449, the harvest data showed that Co. 419 recorded 29.14 tons and Co. 449, 32.20 tons of canes per acre. Co. 419 recorded 16.72 per cent sucrose and 10.09 per cent ces as compared to Co. 449 which recorded 16.83 per cent sucrose and 11.93 per cent ces.

Miscellaneous.—In the bulk observation plots laid out to study the efficacy of Gama BHC. (EC) 20 per cent on the control of early shoot borer, it is seen that the application of Gama BHC in the early stages is effective.

In the bulk observation plots to study the control of termites with the following chemical (1) Aldrin (2) Dieldrin (3) Heptachlor (4) B.H.C. and (5) Control, Heptachlor was found to be effective.

Other crops.—Paddy was the main crop grown in rotation with sugarcane. A total area of 2.13 acres was under paddy during the year. A total quantity of 6041 kg. of paddy seeds was distributed to the district staff.

Sunhemp, Gliricidia and Sesbania were raised as green manure crops. A total of 54.431 kg. of sunhemp 49.836 kg. of gliricidia and 77.111kg. of Pillepesara seeds were collected for distribution to the district staff.

Orchard.—The following layers and seedlings were distributed during the year:—

Rose layers—57 Nos.

Embilica seedlings—13 Nos.

Malta lemon layer—23 Nos.

Scheme for the improvement of Gur Manufacture and Storage.
Large scale storage studies on gur samples.—Ten tons of Jaggery balls and 10 tons of Jaggery cubes purchased in Gudiyatham and Salem tracts were stored in scientific and ordinary godown conditions in two different treatments. Monthly observations with reference to colour and consistency and chemical analysis revealed the following conclusions.

On the onset of rainy season the samples stored in ordinary godown had undergone deterioration in quality to a great extent, the samples becoming syrupy liquid. Moisture absorption was found to be profuse and the fall in polarisation and increase in reducing sugars were the factors affecting the quality of jaggery

The samples stored in scientific godown kept up their consistency throughout the period of storage. However, colour deterioration was gradual in the case of balls and rapid in the case of cubes in both the godowns. Loss of weight in the jaggery in course of storage was much less (2.6 per cent to 4.4 per cent) in scientific godown than in ordinary godown (6.8 to 12.8 per cent).

Chemical composition of juice in relation to chemical and physical characteristics of gur.—Jaggery samples were prepared from Co.419 and Co.449 harvested at the age of 11 to 13 months. Both juice samples prior to balling and jaggery samples were analysed. Co.449 was found to yield good coloured jaggery combined with good crystalline structure at the age of 11 months. The jaggery and juice quality of Co.449 was found to be superior to Co.419.

(19) *Sugarcane Research Sub-Station—Sirugamani.*

Season and Rainfall.—There was a total rainfall of 28.55 inches (713.80 m.m.) distributed over 55 rainy days during the year as against 31.54 inches (788.50 m.m.) over 57 rainy days in the previous year.

The season during the year was normal and quite favourable for cane growth though summer period was very hot without any appreciable rainfall. But no difficulty was experienced for irrigation as a result of adequate and assured water supply in the main irrigation channel. The North-East monsoon was very active during the year. As a result of high velocity wind experienced, accompanied by heavy rain, the crop had very badly lodged. The weather condition as a whole may be considered fairly normal.

Research—A. Agronomy—1. Varietal study plots—1960-61
Main Season.—Fifty eight new Coimbatore varieties received prior to 1959 were planted after multiplication in the study plots in the month of April 1960. in single series observation plots of 1.25 cents each after grouping the varieties into batches of eight, along with the standards Co.419 and Co.449 in each group. Economic characters like germination, tillering, etc., resistance to pest and diseases were studied in detail. The varieties Co.1184, Co.1189, Co. 1206, Co. 1211, Co. 1239 and Co. 1224 recorded above 80 per cent germination. Tillering was very profuse in eleven varieties. Twenty-three varieties arrowed in different degrees ranging from 0.16 per cent in Co.1173 to 33.54 per cent in Co.1223. The infestation of early shoot borer ranged from 6.44 per cent Co.1205 to 25.63 per cent in Co.1249, and that of top borer ranged from 0.89 per cent in Co.898 to 6.50 per cent in Co.997. The varieties Co.1178, Co.1175, Co.1204, Co.1209, Co.1213, Co.1216, Co.1217, Co.1227, Co.1247 were found susceptible to smut. Top rot was recorded in Co. 853, Co. 1181, Co. 1187, Co. 1189, Co. 1199, Co. 1205, Co. 1209, Co. 1216, Co. 1224, Co. 1227, Co. 1235 and Co. 1249. Mosaic was recorded in almost all varieties.

Based on the juice quality and other field habits the following varieties were promoted to the next stages of trial. (Preliminary Yield Trial).

For early season.—(The varieties which recorded 16 per cent sucrose, and 85 per cent Purity in December—January). Co. 711, Co. 810, Co. 853, Co. 997, Co. 1175, Co. 1178, Co. 1193, Co. 1198, Co. 1206, Co. 1216, Co. 1221, Co. 1232, Co. 1247 and Co. 1251.

For late season.—(The varieties which recorded 18 per cent sucrose and 85 per cent purity in April) Co. 898, Co. 1176, Co. 1186, Co. 1191, Co. 1193, Co. 1196, Co. 1199, Co. 1200, Co. 1216 and Co. 1220.

2. 1961-62 *Main Season.*—The trial planted with 70 new varieties (viz. Co. 711 to Co. 1311—(Released from the Sugarcane Breeding Institute, Coimbatore, during 1957-60) and CP. 38/824, CP. 34/19, C.P. 36/105, CP. 49/50 and Pindar) in single series observation plots along with standards Co. 419 and Co. 449 in one cent plot for each variety was in progress. The variety Co. 782 recorded the maximum germination with 94.00 per cent closely followed by Co. 1215 with 36.22 per cent. All varieties have recorded 50 per cent germination. Early vigour was noticed in Co. 1176, Co. 1189, Co. 1196, Co. 1204, Co. 1218, and Co. 1245. Profuse and early tillering was observed in Co. 1178, Co. 1180, Co. 1182, Co. 1200, Co. 1205, Co. 1210, Co. 1213, Co. 1220, and Co. 1309. Very early cane formation was noticed in Co. 1189, Co. 1196, Co. 1235, Co. 1204, Co. 1271, Co. 1247, Co. 1268, and CP/36/105; further observations are in progress.

3. *Preliminary Yield Trial—Early—1961-62 Main Season.*—The trial planted in April, 1961 with the varieties promoted from the 1960-61 Main Season Varietal Study Plot was in progress.

4. *Preliminary Yield Trial—Late—1961-62 Main Season.*—The varieties Co. 898, Co. 1176, Co. 1186, Co. 1191, Co. 1193, Co. 1196, Co. 1199, Co. 1200, Co. 1216 and Co. 1220 promoted after classifying them as varieties suitable for late season from the 1960-61 Main Season Varietal Study Plots were planted during May, 1961 in the Preliminary Yield Trial (Late) in randomised blocks replicated four times along with the standards Co. 419, and Co. 449. Early germination was observed in Co. 1176, Co. 1198, Co. 1200 and Co. 1216. The above trial was in progress.

5. *Main Yield Trial (Early)—1960-61 Main Season.*—It was observed from the Maturity Observation that there was an increasing trend in juice quality from December-February in all varieties and afterwards deterioration was observed in Co. 419, Co. 467, Co. 740, Co. 785 and Co. 1001, Co. 658 kept up its quality throughout. Co. 658, Co. 758 and Co. 449 were outstanding in quality. The variety Co. 467 was poorer in quality.

6. 1961-62 *Main Season.*—The trial with the same set of varieties, viz., Co. 467, Co. 658, Co. 740, Co. 758, Co. 785, Co. 1001 and the two standards Co. 419 and Co. 449 was in progress in

randomised blocks replicated 4 times. The trial was planted in the 2nd week of March 1961. The germination in general was not satisfactory which ranged from 16.89 per cent in Co. 449, Co. 785, to 40.24 per cent in Co. 740. The varieties Co. 785, Co. 1001 and Co. 758 have recorded above 30 per cent of germination. Further observations were in progress.

7. 1960-61 *Special Season.*—In this trial the performance of the varieties Co. 467, Co. 658, Co. 740, Co. 753, Co. 785, Co. 1001 in comparison with Co. 419 and Co. 449 was studied for their suitability consistent with yield and quality for crushing in the Special Season (July-August) in randomised blocks replicated 6 times. The experiment was planted in September 1959 and harvested in October 1960. The results of yield differences were not satisfactorily significant.

8. 1960-61 *Special Season.*—The trial with the same set of 6 varieties, viz., Co. 467, Co. 658, Co. 740, Co. 758, Co. 785, and Co. 1001 and the standards Co. 419 and Co. 449 in randomised blocks replicated 4 times was in progress.

B. Chemistry.—Observation trial with Nitrophoska fertilisers—1. 1960-61 Main Season.—An observation trial with the following treatments, viz—

(i) 250 lb. 'N' on Ammonium Sulphate per acre.

(ii) 250 lb. 'N' as Ammonium Sulphate plus 250 lb.

P205 as Super per acre.

(iii) (250 lb. 'N' plus 250 lb. P205) as Nitrophoska green was conducted with the variety Co. 419 during 1960-61 Main Season. It was observed that the treatment III (i.e. plots manured with Nitrophoska fertilisers) recorded the maximum yield of 61.075 tons per acre with 6.31 tons of C.C.S. per acre, closely followed by Treatment II (250 'N' as Ammonium Sulphate plus 250 lb. P205 as Super.) with 59.555 tons per acre.

2. 1960-61 *Special Season.*—Another observation trial with the same three treatments tried during the Main Season was in progress during the special season with the variety Co. 419 in duplicate observation plots.

5. *Graded Dose of Nitrogen trial and Maturity Observation Plots—1961-62 Main Season.*—A trial to find out the optimum dose of nitrogen required for Sugarcane and also the study the response of sugarcane to the combined basal dressing of Potash and Phosphate was initiated for the first year in April 1961, with the variety Co. 419 in randomised blocks replicated four times with the following eight treatments:

1. 150 lb. 'N' per acre.

2. 150 lb. 'N' plus 80 K₂O plus 60 lb. P₂O₅ per acre.

3. 200 lb. 'N' per acre.

4. 200 lb. 'N' plus 80 K₂O plus 60 lb. P₂O₅ per acre.

5. 250 lb. 'N' per acre.

6. 250 lb. 'N' plus 80 K₂O plus 60 lb. P₂O₅ per acre.

7. 300 lb. 'N' per acre.

8. 300 lb. 'N' plus 808 K₂O plus 60 lb. P₂O₅ per acre.

K₂O and and P₂O₅ applied as basal dressing prior to planting in the form of Muriate of Potash and Super Phosphate. Nitrogen to be applied in the form of Ammonium Sulphate and groundnut cake in two equal doses at 45 and 9 days after planting in the ratio of 2:1 on Nitrogam basis. The germination date revealed that the application of Potash and Phosphate did not appreciably effect in a inducing germination of sugarcane as there was no significant difference in germination among the treatments. Further observation were in progress.

Maturity observation plots of the above trial were also laid out separately which was also in progress.

C. Entomology—(i) *Studies on Borer*.—(a) Early shoot borer (*Chilotrea infuscatellus*) and (b) Top borer (*Scirpophaga nivella*).

General observations on the incidence of early shoot borer, top borer and Internode borer were recorded in the Agronomy trials and other agronomically important varieties. It was observed that there was a general increase in the incidence of early shoot borer attack from May-June which indicated that summer conditions were more favourable for the pest attack.

The internode borer was observed almost throughout the year on standing canes the incidence being towards maturity. All varieties are susceptible to the pest attack. The incidence was observed to be more during the main season than in the special season. Co. 740 is found to be more susceptible to the pest attack.

D. Mycology—1. *Studies on Smut (Ustilage Scitamipecta Syd.)*.—*Varietal Resistance Trial (1960-61 Main Season)*.—A trial to test the varietal resistance to smut was conducted in randomised blocks replicated 8 times with the varieties Co. 419, Co. 449, Co. 467, Co. 658, Co. 740, Co. 758, Co. 785 and Co. 1001. Prior to Planting, the setts were soaked for one hour in water suspension of freshly prepared smut spores. The incidence of smut was recorded at fortnightly intervals till harvest. The smut infection ranged from 6.78 per cent in Co. 1001 to 40.85 per cent in Co. 658 followed by 39.55 per cent in Co. 740. It was observed that the varieties Co. 740 and Co. 658 were consistently more susceptible to smut whilst Co. 1001, Co. 758 and Co. 449 exhibited high degree of resistance.

Clarificant study.—Deola extract and suklaibark extract combined with lime, and lime alone were used as clarificants on Co. 449 juice. Deola extract combined with lime, was found to impart golden yellow colour to the Jaggery prepared from Co. 449. Crystalline structure and consistency were also found to be better.

20. Agricultural Research Station Nanjanad.

Season.—The year under report recorded a rainfall of 62.64 inches on 101 rainy days as against 81.69 inches on 106 rainy days

during the previous year and 61.05 inches on 91.6 days during the past 10 years. The normal rainfall received during the South-West monsoon was well distributed and was beneficial for the autumn crop which yielded an average crop. There was a marked decrease in the total rainfall received during the period as compared to that of the previous year.

The maximum and minimum temperature during the period under report ranged between 54°F to 83°F and 32°F to 69°F respectively.

Crops—A. *Potato*—(i) *Seed multiplication*.—Great Scot being the most popular variety was raised over an area of 40.96 acres in summer, autumn and winter crops and the average yield recorded was 4051.992, 4383.811 and 3124.712 kilograms respectively.

Manurial experiments.—(a) *Studies on the comparative merits of different green manures for potato*.—Potentialities of lupin as a green manure to precede the summer crop and buck-wheat to precede the autumn crop of potato have been confirmed. The trial was started in 1957 and concluded with summer crop of potato 1960.

(b) *Studies on the interaction between the quantity of fertilizer applied and seed size on the yield of potato*.—The trial was initiated with the summer crop of 1960. Variation in the dose of Nanjanad mixture was observed not to influence the yield in potato and seed size not to interact with dose if manure. However, superiority of 2 to 2½ ounces seeds followed by 1 to 1½ ounces with reference to higher yields was indicated.

(c) *Studies to evaluate the optimum fertilizer requirements of a few popular potato varieties on the Nilgiris*.—The trial started in the summer crop of 1960 to study the optimum requirements of N, P and K of a few popular potato varieties, viz., President Bancruachan, Eigenheimer and Great Scot for producing economic yields was in progress. Variation in the doses of N, P and K was observed not to influence the yield in any of the four varieties. However, Bancruachan followed by Great Scot were adjudged to be superior to Eigenheimer and President in the matter of high yields.

(ii) *Cultural experiments*—(a) *Tillage experiment to fix the optimum depth of cultivation for potatoes*.—The trial to fix the optimum depth of cultivation for opening the lands for planting potatoes for maximum yields was continued in the summer crop of 1960 with three treatments. (1) Cultivation to a depth of 4 inches with a Firefly, plough (2) Cultivation to a depth of 6 inches with a victory plough and (3) Cultivation to a depth of 9 inches with a digging fork. The trial was in favour of cultivation to a depth of 6 inches using a Victory plough which recorded the highest yield of 11,986 lb. per acre.

(b) *Studies on the effect of various inward slopes on the yield and incidence of brown rot.*—The trial to assess the optimum inward slope required in bench terraces for producing maximum yields of potato and the minimum incidence of brown rot was initiated in the main crop of 1960 and was continued in the autumn crop of 1960 with the three treatments, viz., 6" drop between the outer and inner edges of the terrace, 9" drop between the outer and inner edges of the terraces and 12" drop between the outer and inner edges of the terraces for 16 feet width of terrace. In the summer crop of 1960, the 12" slope has recorded the maximum yield of 10,444 lb. per acre. In the autumn crop of 1960, 9" slope has recorded the maximum yield of 11,162 lb. per acre. However, brown rot incidence was the highest in 6" slope in both the crops.

(c) *Studies on the effect of mixed cropping on the yield of potatoes.*—The trial to assess the effect of mixed cropping on the yield of potato in view of the recent trends in favour of mixed cropping was commenced in the autumn crop of 1960 and continued during the winter crop of 1961. In the autumn crop of 1960, the inter-crops of cabbage and french beans were a failure and the yield difference was also not significant in any of the three treatments. In the winter crop of 1961, the treatment inter-cropped with french beans has given the highest yield. However, the performance of the inter-crops was poor.

(iii) *Miscellaneous experiments.*—(a) *Studies on the effect of Maleic Hydrazide as a sprout inhibitor for potato.*—The trial to study the effect of Maleic hydrazide spray on the crop on delaying the sprouting of the tubers from that crop was initiated in the summer crop of 1960, with three treatments, viz., one spray of Maleic hydrazide 2500 ppm. 45 days, 60 days and 75 days after planting of potato. As the Maleic hydrazide is insoluble in water and did not make a uniform spray no good result in favour of using Maleic hydrazide as a sprout inhibitor was obtained.

(b) *Studies on the effect of leafroll and mosaic virus on the yield of potato variety, Great Scot.*—The trial to ascertain the effect of leafroll and mosaic viruses on the yield of the popular variety grown on the Nilgiris, viz., Great Scot, was initiated in the summer crop of 1960 and continued during the autumn crop of 1960 with three treatments, viz., Planting Great Scot healthy tubers, Great Scot leafroll affected tubers and Great Scot mosaic affected tubers. The highest yield was recorded by the healthy tubers. The reduction in yield by using mosaic infested tubers does not seem to be as much as in leafroll infested tubers which is significant compared to that of the healthy tubers.

(iv) *Varietal trials.*—*Studies on the performance of 'bolter' plants in the potato variety Great Scot compared to the normal plants of the same variety.*—The above trial was initiated in the summer crop of 1960 and continued during the autumn crop 1960.

The results of both the seasons are indicative that the 'bolter' plants are longer in duration and though not significant, recorded higher yields than the normal plants. The more vigorous bolter plants are also observed to be resistant to leafroll and virus diseases and tolerant to late blight.

B. *Green Manures.*—Lupin was raised over an area of 23.82 acres and 3,746,260 kilograms of lupin seeds were contained. The average acre yield of lupin seed worked out to 165.786 kilograms. Apart from the above, 10.69 acres have been sown for green manure for autumn crop and 8.95 acres for seed production.

C. *Vegetables.*—An area of 0.86 acre was planted to vegetables like cabbage, coulfloower, beans and peas and carrot for seed production. No experimental work was taken up on vegetables.

(v) *Seed Supply—Potato.*—A total quantity of 4621.479 kilograms of disease free Great Scot seed was distributed to State Seed Farms and ryots to cover an area of nearly 46 acres which will give an increased acre yield of 2½ tons per acre.

(ii) *Lupins.*—An extent of about 150 acres would have been covered with the seeds distributed. Taking the average increased output of the potatoes at 2½ tons per acre due to green manuring, the extra output of potatoes is estimated to be 375 metric tons.

(iii) *Economic Plants.*—During the period under report a total quantity of 6,150 numbers of blue gum seedlings was sold to the public during the Vanamahotsava celebrations.

6. *Tree-Planting.*—A total number of 10,830 blue-gum seedlings were planted in the station along the boundary and uncultivated slopes which were making satisfactory progress.

7. *Publicity and Propaganda—Exhibitions.*—The station participated in the Annual Flower Show at Ootacamund and Fruit Show at Coonoor. Besides, exhibits were sent to over 17 exhibitions held all over the State and exhibitions were arranged at this station during the visit of very important persons. Exhibits were also sent for the All-India Exhibition and Fair at Calcutta.

(21) Central Banana Research Station, Aduthurai.

Research.—The total number of varieties including synonyms in the collection during the year amount to 206. A seeded clone of Pey Kunnan was introduced for trial and observation as to the real cause of the alleged fertility. Taxonomic studies were undertaken, using fifteen characters each of which is to some degree diagnostic of difference between *Musa Acuminata* and *Musa Balbisiana*. A scoring method of indicate the relative contributions of the two wild species to the constitution of any given cultivated variety was adopted. Eight banana clones were subjected to such a taxonomic

analysis and were assigned to groups formulated by Simmonds and Shepherd on the basis of ploidy and genomic composition with respect to the parent species.

A total of 118 inflorescences in the commercially important varieties were crossed with available male parents. Seed setting was noticed in seventeen combinations of which only two crosses with Poovan have germinated and are under observation. Nine hybrid progenies evolved at the Kallar Fruit Research Station were studied in detail and were found to be quite inferior to female parents all of which are established commercial varieties. Three selections were made for high grade of bunch. The trial on method of propagation in wet lands indicated that there was no significant difference in yield among different types of planting material used in both the varieties Mauritius and Rasthali suggesting that corms as well as bits can be used for propagation without detriment to yield. Plants of Rasthali raised from the bits of daughter corms appeared to bear an earlier crop when compared to other planting materials. In the case of the variety Mauritius there seems to be no significant differences in duration also.

The observational trial on method of application of manures in perennial are indicated that there was no significant difference between the two methods of application of manures, viz., trench manuring versus manuring in basins in respect of both the varieties Monthan and Poovan. In the irrigation trial in perennial area though there was slight increase in yield of Poovan variety due to irrigation, the same may not be commensurate with the high cost involved in irrigating the area. In the case of Monthan there seems to be no positive effect on yield due to irrigation. The spacing trial in perennial area with the varieties Monthan and Rasthali showed that the closer spacing of 9 feet either way registered higher yield per plant as well as per unit area than the wider spacings of 10 and 11 feet. The rotation trial in wet lands showed that growing two crops of banana followed by sugarcane seems to be the best rotation, for securing higher monetary return. Growing two crops of banana followed by green manure and paddy does not appear to be a profitable rotation practice. Root study was taken up in four plants two in each of Monthan and Poovan. Fruit Development study was conducted in two varieties Monthan and Poovan and the relationship between the fruit volume and the corresponding linear measurements was assessed and a prediction formula evolved.

(22) Fruit Research Station, Periakulam.

Research—(a) Mango.—In mango so far 28 varieties, 9 hybrids and 4 chance seedlings were planted. A leaf disease occurred in the mango rootstock trial causing 29 casualties, the worst affected grafts being *Neelum* on *Olour* rootstock. The disease is under investigation by the Professor of Plant, Plant Pathology, Coimbatore. Manurial doses of N, P and K for the second year were applied to

the trees in the mango manurial trial. Blossom biological studies on mango gave indications that the average percentage of perfect flowers was the highest in *Bangalora* (5.4) and lowest in *Baneshan* (4.5) among the varieties studied. Except selections in varieties *Peterpasand*, *raspuri* and *Cherumani* which were showing symptoms of leaf disease, others have established satisfactorily in the trial of off-season bearing mangoes.

(b) *Citrus*.—In the citrus varietal collection, Italian lemon came to flowering earlier than other lemon varieties except *Villafanch* and *Lisbon* which have not yet come to flowering. Percentage of fruit set was found to be the highest in *Malta* lemon and the lowest in *Nepali* oblong. Budlings in *Sathgudi* and acid lime were raised for rootstock trial, manurial trial and trial of orchard cultural practices. The main fields were under preparation for planting. Selections for nucellar lines and budsports were made in *Sathgudi*, acid lime and pummelo. Orchard efficiency analysis of a *Sathgudi* orchard showed that only 10 per cent of the trees become 4 uneconomical.

(c) *Grapes*.—Harvest data from the grapes training trial indicated that head system of training was found superior to the other two systems, viz., double horizontal cordon and pandal system which were on par. Yield of grapes from irrigation trial showed no significant difference among the treatments. None of the main effects (N.P.K.) or inter-actions (NP, NK and PK) were found significant in the grapes manurial trial. An observational trial of thinning berries in grapes indicated that there was no marked difference in weight of crop among treatments. The berry size and colour were found to be better in treatments of removal of 25 per cent and 30 per cent of the berries.

(d) *Miscellaneous fruits*.—An observational study in *Annona* in the miscellaneous fruits collection showed that variety *Mamineth* had the maximum percentage of fruit set to flowering whereas *Red* selection No. 3 recorded the least. In guava percentage of fruit set to flowering was the highest in '*Bapatla*' and the minimum in 'Seedless' guava. Size of the fruit was found biggest in the variety *Lucknow* 49 when compared to other varieties of guava. Among fig selections *Dindigul*, *Kalhatti*, *Kodaikanal* and *Local* were found more vigorous than the other varieties. Variety *Brown Turkey* took the minimum number of days (52) from flowering to fruit set while *Kalhatti* came to harvest only 68 days after flowering. Among pomegranate selections, *Penukonda* and *Vellodu* were found more vigorous than other selections.

Supply of plants, etc.—During the year under report the following seeds and plants were sold.

Groundnut pods—978 Kgs.

Co., Papay Seeds—0.490 Kgs.

Glyricidia Seeds—7,500 Kgs.
 Flower Seeds Packets—5 Nos.
 Glyricidia Cuttings—600 Nos.
 Bapakki Seedlings—12 Nos.

Economic Results of Research.—The trials programmed at this station are of a long range nature and the work is only in the initial stage. Hence it is too early to disseminate the results obtained so far as they require confirmation by continuing the trials over a few more years.

(28) Government Botanic Gardens, Ootacamund.

(a) *Enquiries.*—A total of 650 enquiries on ornamental gardening and other branches of horticulture was attended to during the period.

(b) *Inspection of private gardens.*—Twenty private gardens belonging to different categories were visited to give necessary advice and suitable suggestions for the improvement.

(c) *Meetings and gatherings of growers.*—There were no meetings or gatherings of growers during the period. However, the growers took part in the sixty-sixth Annual Spring Flower Show by Nilgiris Agri-Horticultural Society held during May 1961. Exhibits and decoration materials were also supplied from the station for the first National Agricultural Fair held at Calcutta during January-February 1961.

Research—(a) *New introduction.*—The following were the new introductions made at this station during the year:—

1. *Anthemis nobilis.*
2. *Valeriana Officinalis.*
3. *Chicorium introglus.*
4. *Heliconia Braziliensis.*
5. *Passiflora caerulea.*

Out of the plants introduced during the previous years crops were successfully raised in *Angelica archangelica*, *Chicorium intybus*, *Ferula tingitana*, *Mentha piperata*, *Saussurea lappa* and *Ammi visnaga*.

Viability studies in seeds of Annuals and trees.—Monthly germinations tests were conducted with seeds of three trees namely *Acacia decurrens*, *Acer Oblongum* and *Cupressus funebris* and of two annuals namely *Antirrhinum* and *Stock*. From the trial it was observed that the seeds of *Antirrhinum* could be stored without detriment to their germination till the period under report. In the case of seeds, *Acacia decurrens* recorded good germination only from fifth to eight month from storage, while germination was very poor in the case of all other seeds put under trial.

Studies on growth and flowering of orchids.—The growth and flowering of six kinds of orchids were studied during the period. It was observed that the growth in respect of *Goelogyne barbata* and *Epidendrum pseudoepidendrum* was uniform through out the year while in the case of *Gymbidium eburneum*, *Cypripedium insigne* and *Dendrobium densiflorum* there was no regular growth during the period. None of the orchids except *Stanhopea wardii* had recorded any distinct period of dormancy during their cycle of growth. All the orchids except *Dendrobium densiflorum* had borne flowers during the period.

Selection and seed or plant multiplication of Amaryllis and Begonias.—A comprehensive collection of thirty varieties and kinds of Begonias and twenty-four of Amaryllis was built up during the period and their vegetative and floral characteristics studied on the basis of suitable descriptive blanks to isolate superior ones.

(11) Sim's Park, Coonoor.

Advisory.—(a) A total of 379 oral and written enquiries on availability of plants, seeds, etc., and on various aspects of gardening was attended to promptly.

(b) Six private gardens were visited for advice.

(c) A separate stall displaying the ornamental wealth of the station was put up during the Seventh Annual Fruit Show held at Sim's Park, in May 1961. Cut flowers sent to the First Annual Grape Show held at Coimbatore, from this centre were awarded a prize. Ornamental exhibits were also sent for decoration during the College Day and Conference at the Agricultural College, Coimbatore in August 1960.

(d) The Assistant, Sim's Park, was deputed to Calcutta for looking after the Horticultural Stall of the Madras Pavilion erected at the National Agricultural Fair from 15th December 1960 to 20th January 1961.

Research—Items of research undertaken and results obtained:—
 (1) *New Introduction.*—*Ferula Itingitana*, *Saussurea lappa* and *Chicory* were successfully introduced from seeds. *Menthol*, *Peltophorum africanum*, *Bauhinia caronii* and *Brachiton rupestre* were successfully established in the park. The cork plant *Quercus suber* was also added to the existing collection of *Quercus* species.

Seedlings of *Ferula tingitana*, *Saussurea lappa* and *Chicorium intybus* (Chicory) were successfully raised and transplanted. Plants of *Menthol*, *Peltophorum africanum*, *Bauhinia caronii*, *Brachiton rupestre* were successfully established in the Park. One Plant of cork tree (*Quercus suber*) was also added to the existing collection of *Quercus* species.

Viability studies with seeds of selected annuals and trees indicated possibility of storing seeds in general under ordinary conditions of storage for a minimum period of six months without appreciable loss of viability.

Investigation had shown that seeds of Zinnia double and French Marigold could be stored under ordinary conditions for a period of nine months from the time of collection without appreciable loss of viability, whereas those of Dianthus mixed could be kept for a little longer period. That jacaranda seeds, could be stored for six months and those of Eucalyptus citriodora for over eight months at a fairly high level of viability were also found out.

For roses, pruning should be so timed as to encourage flower bud formation to coincide with the dry hot weather since wet weather promoted vegetative growth at the expense of flowering. Camellia and Azalea were found to be typical winter-flowering plants and flowers were borne mostly on past season's growth.

Bright sunny weather free from rains is conducive to flower-bud formation on roses, while long continuous period of wet weather promotes sappy vegetative growth at the expense of flower production. That the peak flowering in Camellia Japanica was during September to November, and that the same in Azalea indica was October—November months were recorded. Further in both the winter flowering shrubs, blossoming extended up to the end of February, depending upon the minimum night temperature and also flowers were borne mainly on past season's shoots.

Under varietal collection of Gladiolus and Dahlia, propagation of 21 varieties of giant decorative dahlias, 19 of the Cactus group and three of the Pompon group and 32 varieties of Gladiolus was carried out.

Works.—The following were the improvements carried out during the period:—

The second stage of cement concreting of footpaths confined to the lower portions of the Park was carried out departmentally during the period. The motorable road from the Orange Shola corner to the Rest House was black-topped by the Public Works Department during the period. Also the open verandah of the Rest House was enclosed by glass shutters, providing better occupational space, by the Public Works department, during the period.

IX. CROP SAMPLING SURVEYS.

Crop sampling surveys on paddy and the millet crops (viz., Cholan, Cumbu and Ragi) for estimating the average yield and production of these crops for the individual districts and State as a whole were continued during 1370 fasli (1960-61). The survey for the statistical assessment of additional production of paddy due to the application of three principal "Grow More Food" aids, viz., improved (paddy) seed, green manure and ammonium sulphate was also continued.

The technical control of the surveys 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, except in Kanyakumari district, while that on millet crops by the Revenue Inspectors. The work of the field staff in the districts was supervised by the concerned District Statistical Officer.

Results of the survey on paddy and millets.—The results for the State as a whole in respect of each category of crop are furnished in Appendix 32.

Grow More Food Assessment Survey.—As regards the survey the additional production of rice due to the application of "Grow More Food" aids, the total number of experiments planned (under three principal aids) during 1960-62 was 750, out of which 346 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 33.

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 1960-61 also. Sanction was accorded by the Government, for the conduct of 100 pairs of experiments in the villages of Ketty, Nanjanad and Ooty and 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 in non-terraced plots, control plots/were completed under the supervision of the District Statistical Officer, Nilgiris. From the data collected, the difference in the average yields was estimated as 2,571 lb./acre or 2,882 Kg./Ha.

X. PROPAGANDA, DEMONSTRATION AND PUBLICITY.

Propaganda.—The Agricultural Extension staff intensified their propaganda and demonstration 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 of paddy and sugarcane, green manuring with Sasbania and other green manures, and organising Village Seed Farms for paddy and millets. The extension staff constantly toured the villages and contacted villagers individually and collectively.

ADMINISTRATION REPORT OF THE

Demonstration Plots.—To make propaganda effective and to serve as ocular demonstration, 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 95,799 demonstrations were conducted.

Special efforts were made to lay demonstration plots on the Japanese method of paddy cultivation and about 37,713 such demonstration plots were conducted attaining the target of at least one plot for each village in the State.

Agricultural Associations.—For popularising the agricultural improvements, Agricultural Associations were formed in various villages and the members were induced to adopt all the improved practices for increasing production.

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 a simple precise and clear manner carrying simple messages to the farmer in a catchy and impressive way.

During the year under report, 2,86,800 copies of Mezhielvai, and 25,000 copies of Villagers' Guide and Calender were distributed and 100 Exhibitions were conducted.

Radio talks.—The following Radio talks were delivered through All-India Radio by the Departmental Officers.

Name of the officer.	Subject.	Station.	Date.
(1)	(2)	(3)	(4)
1 Sri S. Rameswamy, B. Sc., (Agriculture) Cane Development Officer, Madras.	"Sugarcane Development in Madras State - English."	All India Radio, Madras.	21st January 1961.
2 Sri N. Sankaranarayana Reddy, Joint Director of Agriculture (Engineering) Madras.	"Soil Erosion—(Tamil)."	Do.	25th January 1961.
3 Sri V. Karthikeyan, I. A. S., Director of Agriculture, Madras.	"Progress of Land Reforms-English."	Do.	18th March 1961.
4 Do.	Progress of Land Reforms-(Tamil.)	Do.	22nd March 1961.
5 Sri C. R. Seshadri, B. Sc., Joint Director of Agriculture, (Planning and Development) Madras.	"New Methods in Agriculture English."	Do.	1st April 1961.

Seed Multiplication—Scheme for the distribution of improved seeds of paddy and millets for 1960-61.—The object of the scheme is to saturate the entire area of cultivable lands with the improved seeds. The nucleus seeds obtained from the Agricultural Research Stations were further multiplied in the State Seed Farms and then given to other cultivators. In block areas whenever

Block Councils were formed, this process of multiplication by Village Seeds Form Growers was done by Gramasahayaks to whom a subsidy of Rs. 2 per railway maund of seeds is given by the Department.

During the year under report the following quantities of seeds were distributed :—

Paddy (P)	.. ..	2,665	(METRIC TONNES.)
Paddy (VSF)	.. ..	20,758	Do.
Millets (P)	.. ..	375	Do.
Millets (VSF)	.. ..	2,301	Do.

State Seed Farms.— (1) 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 seed 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.

2. During the period from 1st July 1960 to 30th June 1961, 16 State Seed Farms of 25 acres each were opened and 16 farms were closed. The list of farm functioning in this State as on 1st July 1961 is furnished in Appendix 9.

3. Sri A. A. Jhonson, Seed Expert, Rockefeller and Ford Foundation, who visited the State Seed Farm, Sakkottai and Marudanallur on 7th September 1960 has recorded the following remarks in the visitors' book of the farm :—

"A serene well kept spot, visited late in the after-noon. This has the appearance of being a well kept Seed Farm"

Japanese Method of Paddy Cultivation.—The Japanese Method of paddy Cultivation, comprising of the following four major operations, viz., (1) Use of improved seeds (2) Use of adequate dosage of fertilisers (3) Line planting and (4) Inter-cultivation, is gaining ground. It is getting popular among the ryots. Many of the ryots hesitated to adopt this method under the impression that this involved more expense. But when compared to the additional yield obtained, the extra expenditure is small. Besides, the Labourers are to be trained for line planting work. Concerted efforts are needed to educate the labourers in the Japanese Method of Paddy Cultivation and also the ryots to adopt this method. No sparate staff is available at present for this Scheme. Still propaganda work is carried by the District Agricultural Officers with the existing staff. During the year from 1st July 1960 to 30th June 1961, a total area of 20,70,459 acres was covered under this method.

Cotton Development.—The following seed multiplication schemes were in progress :—

MCU. 1. Scheme.—During the year, procurement of MUC. 1. Seeds was done through private agencies at Coimbatore and through the Seed Farm Ryots' Association at Tiruppur Centre. Besides this, the Agricultural Department undertook purchase of seed farm kapas from ryots on behalf of the Jail Department and supplied 1,73,662 lb of pure Uganda line to the Central Jail, Coimbatore.

The particulars of arrival of kapas, seeds procured and seeds supplied to the districts are furnished below :—

(a) *Kapas arrivals*—

Serial number and Centre.	Nominees.		Association.		Jail Department.		Total.	
	P.	M. lb.	P.	M. lb.	P.	M. lb.	P.	M. lb.
(1)	(2)		(3)		(4)		(5)	
1 Coimbatore ..	4,943	2 26	....		251	5 5	5,194	8 3
2 Tiruppur ...	600	0 0	2,823	0 27	162	3 17	2,085	4 16
Total ..	5,543	2 26	2,823	0 27	413	8 22	8,780	2 19

(b) *Seed Procurement.*

Serial number and Centre of Procurement.	Source of Procurement.	Quantity procured in bags of 100 lb.	Remarks.
(1)	(2)	(3)	(4)
1 Coimbatore ..	Nominees	6,880-00	..
	Cotton Breeding Station and Central Farm.	121-70	
	Jails Department	324-00	
2 Tiruppur ..	Nominees	960-00	..
	Association	4,180-00	
	Jail Department	186-00	
Total ..		12,651-70	

The quantity procured represents 70 per cent of the target.—

(c) *Seed Distribution.*

Serial number and particulars.	Source of supply.		Total.
	Coimbatore. in bags of 100 lb. net.	Tiruppur. in bags of 100 lb. net.	
(1)	(2)	(3)	(4)
1 Seed Farm Sowing	635-60	469-00	1,104-60
2 State Seed Farms	26-70	..	26-70
3 Cotton Extension	6,401-40	5,115-00	11,516-40
4 Sales and Transfers	..	4-00	4-00
Total ..	7,063-70	5,588-00	12,651-70

The district-war distribution of seeds under Cotton Extension is summarised below :—

Serial number and name of the district.	Quantity supplied in bags.
1 Salem	2,785-00
2 South Arcot	209-00
3 Chingleput	37-00
4 Tanjore	20-35
5 Ramnad	47-00
6 North Arcot	147-00
7 Trichy	482-00
8 Coimbatore	6,257-05
9 Madurai	1,525-00
10 Kanyakumari	2-00
11 Nilgiris	5-00
Total ..	11,516-40

Seed farms.—An area of 6,250 acres against the target of 6,000 acres was raised during this period. The entire crop was given thorough roguing and the purity was maintained at a high degree. Off-types spotted were less than 2 per cent. The procurement of seeds was taken up from February 1961. It was done through nominated merchants as well as through Seed Farm Ryots' Association, Tiruppur.

Details of arrivals of seed farm kapas and procurement of seeds are detailed below :—

Serial number and centre.	Quantity Pothies.	Maunds.	Lb.
(1)	(2)	(3)	(4)
1 Coimbatore	10,259	0	7
2 Tiruppur	2,170	7	18
Total ..	12,429	7	25

Serial number and Centre.	Quantity in bags of 160 lb.	
	M.O.U. 1.	M.O.V. 3.
(1)	(2)	(3)
1 Coimbatore	11,245	45
2 Tiruppur	4,477	212
Total ..	15,722	257

K 5 Scheme.—According to the proposals of the scheme on multiplication and distribution of K5 Cotton, an extent of 20,000 acres had to be raised during the final year of operation of the scheme. The scheme was in operation for 2 years from 1st October 1958, and was closed on 30th September 1960.

A new scheme for multiplication and distribution of K6 cotton over an extent of 20,000 acres was put into operation from 1st October 1960, and the work on this was being carried on.

Details of procurement and distribution of K5 cotton as well as K6 cotton are summarised below :—

(a) *Kapas arrival (K5) cotton, 1959-60 Season.*

Serial number and Centre.	Source of procurement.						Total.	
	Nominees.			Intensive Khadi Scheme.				
	P.	M.	lb.	P.	M.	lb.	P.	M. lb.
(1)	(2)			(3)			(4)	
1 Palladam	546	5	24	751	3	11	1,297	9 7
2 Sular	488	2	23	375	1	20	863	4 15
3 Udumalpet	496	9	25	..	..	..	496	9 25
Total ..	1,531	8	16	1,126	5	03	2,658	3 19

(b) *Seeds procurement (K5) in bag of 100 lb.*

Serial number and sources of procurement.	Palladam.	Sular.	Udumalpet.	Total.
(1)	(2)	(3)	(4)	(5)
1 Nominees	1,366.10	248.00	497.00	2,111.10
2 Central Farm and Cotton Breeding Station.	..	..	..	..
3 Intensive Khadi Scheme ..	..	175.00	..	175.00
Total ..	1,366.10	423.00	497.00	2,286.10

(c) *Details of distribution of seeds (in bags of 100 lb.)*

Serial number and particulars.	Palladam.	Sular.	Udumalpet.	Total.
(1)	(2)	(3)	(4)	(5)
1 Seed farm sowings ..	6.00	..	..	6.00
2 Extension plan ..	1,366.10	423.00	497.00	2,286.10
3 Sales	..	..	..	..
Total ..	1,372.10	423.00	497.00	2,292.10

K6 Cotton Scheme.—An extent of 21,117 acres was raised with K6 cotton under seed farm conditions. These acres were spread over Palladam, Sular, and Udumalpet taluks. Seeds for

raising these areas were obtained from Kovilpatti Centre. Details of area and quantity issued are detailed below :

Serial number and Centre.	Number of ryots.	Quantity of seed issued in bags of 100 lb.	Extent raised in acres.
(1)	(2)	(3)	(4)
1 Palladam	168	907	5,610 00
2 Sular	220	810	5,458 80
3 Udumalpet	289	1,510	10,049 00
Total ..	677	3,227	21,117 80

Roguing of the seed farms for maintaining the purity was taken up. The percentage of off types spotted ranged from 5 per cent to 10 per cent. The whole area was rogued.

Procurement.—Procurement of seeds during 1961-62 season was in progress. The processing of kapas was in various stages. Details of quantity of kapas procured so far as summarised below :—

Serial number and centre.	Nominees.		
	Pothies.	Maunds.	Lb.
(1)	(2)	(3)	(4)
1 Palladam	1,598	4	11
2 Sular	449	3	20
3 Udumalpet	1,479	9	24
Total ..	3,437	7	27

Disbursement of Loans and recovery from seed farm ryots.—Disbursement of advances to Seed Farm Ryots was made in two instalments, the first as seed before sowing and the second as cash, to meet the cultivation expense during growth period. The recovery of these was made during the marketing season of the procedure, i.e., from March to September. The following table indicates the particulars of seed farm loans issued during 1959-60 and collected during 1960-61 as well as loans disbursed during 1960-61. The recovery of Loans issued during 1960-61 was in progress.

Details for 1959-60 Loans		NOU. 1 Scheme.	K 5 Scheme.
(1)	(2)	(3)	(3)
	RS.	RS.	RS.
1 Amount disbursed ..	1,52,282 44	2,53,448 06	
2 Amount recovered ..	1,48,068 10	2,51,143 93	
3 Balance	3,814 34	2,307 83	
4 Percentage of recovery	97.5 per cent.	99.1 per cent.	
1960-61 (Disbursement of Loans).			
Name of scheme.		Number of ryots.	Amount.
(1)	(2)	(3)	(3)
			RS.
MCU-1 Scheme	585		1,96,291 01
K6 Scheme	677		1,64,085 75
Total ..	1,262		3,60,376 76

Multiplication and distribution of K6 and MCU 2 Cotton.—

(a) *Seed Farm arrangements*—(i) *Karunganni 6.*—An effective area of about 31,369 acres was sown under K6 as against the target of 30,000 acres, under seed farm conditions during 1960-61 season.

(ii) *Madras Cambodia, Uganda 2.*—An area of about 5,880 acres was sown under seed farm condition during 1961 summer against the targetted area of 6,000 acres.

(b) *Procurement and distribution*—(1) *Karunganni.*—The total procurement and distribution of Karunganni seeds during 1959-60 season was as follows :—

	K. 2.	K. 6.	Total.
	(in bags of 112 lb. each.)		
(1)	(2)	(3)	(4)
Total procurement for the season.	5,334	7,706	13,040
Distributed to the Cotton Extension Scheme.	5,334	647	5,981
Supplied to the Assistant Cotton Specialist, Tiruppur.	..	2,600	2,600
Distribution for seed farm sowings.	..	4,459	4,459

(ii) *Madras Cambodia Uganda 2.*—Out of a total quantity of 13,593 bags bagged for 1960 summer season, only 8,012 bags (100 lb. each) of good viable seeds were procured through germination test. The distribution was effected as follows :—

	Bags of 100 lb. each.
(1)	(2)
1 Supplied to various districts as per Cotton Extension Officer's indent.	4,337
2 Quantity distributed in Srivilliputhur taluk by the Society.	2,087
3 Quantity distributed for seed farm sowings	1,588
Total	8,012

(c) *Issue of advances and recovery of arrears (1960-61).*—The issue of cultivation advances and recovery of arrears from the current year as well as from the previous years in respect of K6 and MCU 2 zone are presented below :—

Zone.	Advance issued.	Arrear recovered.
(1)	(2)	(3)
	RS.	RS.
K6	2,81,500	1,66,520
MCU 2	2,19,200	93,296

A total amount of Rs. 43,79,731 was disbursed to seed farm ryots of K6 and MCU 2 zones, towards the seed and cultivation advances from the inception of the scheme (1950-51) and a substantial recovery of Rs. 40,05,109 has been effected so far achieving 91 per cent of recovery.

Work under the Cotton Extension Plan.—The various measures of improvement aimed to step up cotton production under the Cotton Extension Scheme remained the same as in the previous years and were as follows :—

A. *Extension of area :—*

- (1) Reclamation of fallows and waste lands.
- (2) Replacement of other crops.
- (3) Double cropping.

B. *Intensive cultivation :—*

- (4) Inter-cropping.
- (5) Distribution of Improved Cotton Seeds.
- (6) Application of fertilizers.
- (7) Adoption of Plant Protection Measures.
- (8) Adoption of improved cultural practices.

The share of Madras State in increasing the cotton production under Cotton Extension Plan was fixed at 4.50 lakhs bales of lint to be achieved at the end of Second Five-Year Plan. Subsequently this was reduced to 4.20 lakhs. Thus an increase of 1.08 lakhs bales over the estimated cotton production of 3.12 lakhs bales at the end of First Five-Year Plan was targetted.

The increased target was as usual split up under the various measures of improvement. Each unit of extension staff in the district was allotted a target and the progress was watched.

Extension of area under cotton.—The final figures of area are not yet available. But from the fourth forecast report it is seen that there is slight increase in 1960-61 as compared to the area in the corresponding period of 1959-60.

Fourth Forecast of Cotton Crop in Madras State :—

	1960-61	1959-60
Total area.	8,84,100 acres.	8,75,100 acres.

Procurement and distribution of improved strains.—The present cultivated improved strains in Madras State are MUC 1, MUC 2 and P. 216F belonging to American uplands and K5, K2 and K6 coming under rainfed. K6 will replace K2 and K5 as it is a superior type and has a cosmopolitan habit. The seeds of the improved strains are being procured through the seed multiplication distribution schemes functioning in the State. Quantities of

improved seeds targetted for distribution during 1960-61 season and those actually procured and distributed are furnished below :—

Serial number and name of variety.	In Bengal Mds. of 82 2/7 lb.			Balance.
	Quantity targetted.	Quantity procured.	Quantity distributed.	
(1)	(2)	(3)	(4)	(5)
1 MCU. 1	22,500	15,800	15,800	..
2 MCU. 2	15,000	9,737	9,737	..
3 P 216F	3,000	883	838	45
4 K2	15,000	7,076	6,624	452
5 K6	..	10,295	10,295	..
6 K5	8,400	2,575	2,348	227
Total ..	63,900	46,366	45,642	724

Out of the balance quantity of 45 maunds of P 216 F cotton seeds, 35 maunds were sold to Orissa State and the remaining quantity of 10 maunds will be sold during 1961-62 season for sowing purposes. A quantity of 225 maunds of K5 cotton seeds was transferred to Agricultural Research Stations and State Farms for use as cattle food since these varieties are proposed to be replaced by K6 during 1961-62.

The procurement of seed in all items was short of the target fixed on account of the poor yield of the crop during the last season which affected the procurement. Out of a targetted quantity of 63,900 maunds only 46,366 maunds could be procured.

Fertilizers and pests.—On account of the intensive propaganda done by the departmental staff, growers have come to realise the value of fertilizers and there was good demand for the same. Against a total area of 225,800 acres targetted to be applied with fertilizers, an area of 180,456 acres was covered. The short-fall in achievement was mainly due to the shortage of ammonium sulphate in the market. A sum of Rs. 6,00,000 was sanctioned by the Government of India for the grant of Taccavi loan in kind as fertilizers to the irrigated Cambodia cotton. The concession could not be availed of for the irrigated winter sown Cambodia crop as the sanction was received late. Even for the Masipattam crop the sanctioned grant could not be fully utilized as the communication of the grant was received by the District Agricultural Officers only in the month of March 1961.

As regards pesticides the position was better than last season as they were available in the market. Due to propaganda done most of the growers in Coimbatore district sprayed their crops to protect them against insect pests. They have come to realize that without plant protection measures they could not get good yields. Still this

practice has not come into vogue to the extent desired in the Masipattam areas of Madurai, Ramanathapuram and Tirunelveli districts in spite of propaganda done. In places affected by drought in the Coimbatore, Salem and Tiruchirappalli districts, many growers did not take up plant protection methods as the growth and yield prospects this season were not encouraging to them. Hence there was some short fall.

Achievements of additional area and production under Cotton Extension Scheme :—

Particulars.	Area in acres.		Estimated additional production in bales.	
	Target for 12 months.	Achievement (9 months only) (1st July 1960 to 31st March 1961).	Target.	Achievement.
(1)	(2)	(3)	(4)	(5)
A. Extension of area—				
1 Reclamation of fallows ..	9,620	15,096	2,405	3,774
2 Replacement of other crops ..	88,000	28,438	44,000	14,219
3 Double cropping ..	81,900	35,114	40,950	17,557
B. Extensive cultivation—				
1 Inter cropping ..	89,700	53,400	11,213	6,675
2 Use of improved seeds ..	487,790	374,250	19,508	14,970
3 Application of fertilizers ..	225,800	180,456	28,226	22,557
4 Plant Protection ..	292,400	200,680	3,654	2,576
5 Improved cultural practices ..	403,900	132,320	5,004	1,654
Total ..			155,000	83,982

There is short-fall in all items except under "reclamation of fallow and waste lands". The reasons are given below :—

Firstly the short-fall in achievement is partly due to the change effected in the period of report from 12 months to 9 months consequent to the change from fasli year to financial year. The data presented relate to a period of nine months only from 1st July 1960 to 31st March 1961. Under replacement of other crops and "Double Cropping" the short-fall is due to the rise in the price of groundnut on account of which the growers preferred to grow groundnut in place of cotton. In the river valley project areas, restrictions in cropping, viz., ban on wet crops has been removed and the growers are allowed to raise wet crops like paddy and sugarcane. So the growers are now preferring to grow paddy and sugarcane in the ayacut areas instead of cotton. This has

affected the expansion of cotton area. The target under "Double Cropping" could not be covered for want of irrigation facilities during summer in the rice-growing areas.

The procurement of MUC. 1 and P. 216F seeds fell below expectations on account of the poor crop. The sale of seeds by merchants on loan basis attracts the poor class of farmers and to this extent the departmental sale is reduced. The targetted area under application of fertilizers could not be covered due to shortage of fertilizers in the market and diversion of available fertilizers to paddy and sugarcane. Prevalence of drought affected the intercropping of cotton with other crops. On account of the high prices paid for groundnut the growers preferred to sow a pure crop of groundnut instead of raising a groundnut cotton mixture. All these factors contributed to the non-achievement of the target in cotton production.

Oil seeds development.—The Oil Seeds Development Officer, Coimbatore, was in charge of the following seven schemes:—

(i) Scheme for the development of oil-seeds within Five-Year Plan.

(ii) Extension Scheme for the increased production of oil seeds in the irrigated project areas outside Five-Year Plan.

(iii) Scheme to run four Zonal Nucleus Seed Farms of groundnut and castor.

(iv) Scheme for crop yield competition of groundnut.

(v) Scheme for the free distribution of castor seeds.

(vi) Scheme for the free distribution of Iluppai seeds.

(vii) Scheme for large-scale production and distribution of castor seeds.

The work done during the year under the different schemes is given hereunder in detail:—

I. *The Scheme for the Development of Oil Seeds within Second Five-Year Plan—Object of the scheme.*—This scheme aimed at an additional production of 70,000 tons of oil seeds namely, groundnut, gingelly and castor by the end of the Second Five-Year Plan period which terminated on 31st March 1961. The scheme was sanctioned in G.O. Ms. No. 1400, Food and Agriculture, dated 30th April 1957.

The above stated additional production of 70,000 tons was proposed to be achieved through the following three measures:—

- (1) Spread of Improved Strains.
- (2) Intensive Cultivation Measures.
- (3) Extension of area under oil seeds.

Achievements during the year—(a) Spread of Improved Strains—Quantity of seeds procured and distributed:—

Serial number and name of the crop.	Target in maunds.	Procurement in maunds.	Distributed in maunds.
(1)	(2)	(3)	(4)
1 Groundnut	24,000	5,098	6,461
2 Gingelly	1,500	28	135
3 Castor	600	128	485
Total ..	26,100	5,254	7,081

(b) Progress of seed 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)
Groundnut	800	745	4,000	3,745
2 Gingelly	780	960	..	..
3 Castor	1,560	1,366	..	..
Total ..	3,140	3,071	4,000	3,745

(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.	522,700	28,889	520,443	32,306
2 Intensive cultivation ..	516,660	22,973	694,080	32,348
3 Extension of area	272,762	45,638	294,175	81,396
Total ..	1,312,122	97,500	1,508,698	146,050

The achievement under total production was 146,050 tons.

II. *Scheme for extension of oilseed 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 90,000 tons of oilseeds in the project areas by the end of Second Five-Year Plan period.

Sphere of operation.—It was proposed to work the scheme in project areas of Lower Bhavani, Cauvery, Mettur, Manimuthar, Amaravathi, Sathanur and Krishnagiri Project area during the year.

To achieve the target, it was proposed to introduce the oil-seed crops such as groundnut, gingelly and castor in the project areas and intensively cultivate them. Besides the extension of

area under oilseeds by means of reclamation of lands, double cropping and inter-cropping, the yield was proposed to be stepped up by spreading improved strains, adopting intensive cultivation method and plant protection measures :—

Work done during 1960-61 under the scheme.—The scheme was implemented on 1st January 1958 and the achievements are furnished in the tabulated statement below :—

(a) *Quantity of seeds procured and distributed during 1960-61 :—*

Serial number and crop.	Target.	Procurement in maunds.	Distribution in maunds.
(1)	(2)	(3)	(4)
1 Groundnut	5,600	2,657	1,702
2 Gingelly	400	174	60
3 Castor	400	68	54
Total	6,400	2,899	1,816

(b) *Details of Primary and Secondary Seed Farms arranged :—*

Serial number and name of the crops.	Target in acres.		Attainment.	
	Primary.	Secondary.	Primary.	Secondary.
(1)	(2)	(3)	(4)	(5)
1 Groundnut	187	935	143	760
Gingelly	200	..	305	247
3 Castor	800	..	321	536
Total	1,187	935	769	1,543

The additional production achieved under scheme crop-wise :—

Serial number and name of the crop.	Target.		Achievement.	
	Area covered.	Production in tons.	Area covered.	Production in tons.
(1)	(2)	(3)	(4)	(5)
1 Groundnut	427,800	115,500	323,183	82,444
2 Gingelly	174,000	9,900	73,828	4,349
3 Castor	64,500	2,600	50,753	2,360
Total	666,100	128,000	447,764	89,143

III. *The scheme for running the four zonal nucleus seed farms of groundnut and castor in Madras State.*—The scheme was sanctioned in G.O. Ms. No. 1766, Food and Agriculture, dated 7th June 1957 to run four zonal nucleus seed farms of improved

strains of groundnut and castor for a period of four years and three months from 30th December 1956 to 31st March 1961 at a total cost of Rs. 2,77,756.

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 Farm and Primary Seed Farms in ryots holding and distribution in various districts.

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 zonal nucleus seed farm and area devoted for each strain is furnished in the table below :—

Total Extent of Groundnut and Castor.					
TMV. 1.	TMV. 2.	TMV. 3.	TMV. 4.	TMV. 2.	TMV. 3.
(Area in acres).					
(1)	(2)	(3)	(4)	(5)	(6)
56.00	109.00	80.00	5.00	10.00	10.00

Target and achievements.—As against a target of 191,675 lb. of oil seeds 65,279 lb. of seeds were procured and distributed as detailed below :—

	Groundnut.				Castor.	
	TMV. 1.	TMV. 2.	TMV. 3.	TMV. 4.	TMV. 2.	TMV. 3.
	(1)	(2)	(3)	(4)	(5)	(6)
	LB.	LB.	LB.	LB.	LB.	LB.
1 Target for the year 1960-61.	51,000	71,500	60,900	3,375	2,400	2,500
2 Achievement during 1960-61.	10,420	24,460	27,290	2,240	869	..

The seeds were distributed to sow an area of 641 acres of primary seed farms.

IV. *Scheme for the free distribution of castor seeds to the cultivators.*—The scheme for the free distribution of castor seeds to the cultivators in Madras State was first sanctioned in G.O. Ms. No. 3653, Food and Agriculture, dated 4th November 1958 for a period of one year at a total cost of Rs. 2,750 as detailed below :—

	RS.
Cost of seeds	2,500
Incidental charges	250
Total	2,750

The scheme was again continued in G.O. Ms. No. 3881, dated 12th November 1959 for a period of one more year. In G.O. Ms. No. 2169, Food and Agriculture, dated 22nd June 1960 it was also extended for a further period of one year during 1960-61. The total cost of the scheme was Rs. 5,500.

Object of the scheme.—The object of the scheme was to popularize the practice of mixed cropping of castor with other crops so that the area under castor can be increased considerably.

It was also proposed under the scheme to induce the ryots to grow castor on cantour bunds, waste areas, canal and railway embankments and interior lands.

Work done.—During the year 1960-61 a sum of Rs. 5,500 was sanctioned by the committee to purchase and distribute 20,000 lb. of castor seeds. But actually only 9,092 lb. of castor seeds were purchased at a cost of Rs. 2,305.54 and distributed. An area of 2,997 acres was planted and 1,734 ryots were benefited.

A total number of 2,918 ryots were benefited since the inception of the scheme and an area of 8,351.17 acres was brought under castor.

V. Scheme for procurement and free distribution of mahua seedlings in Madras State.—The scheme for free distribution of Mahua seedlings in Madras State was first sanctioned in G.O. Ms. No. 2405, Food and Agriculture, dated 12th July 1960 for a period of two years from 1st September 1960, at a total cost of Rs. 1,000 as detailed below:—

	I Year.	II Year.	Total.
(1)	(2)	(3)	(4)
1 Cost of seeds	400	400	800
2 Incidental charges for distribution of seedlings.	100	100	200
Total ..	500	500	1,000

Object of the scheme.—The object of the scheme is to purchase Mahua seeds, raise seedlings and distribute the same to the public.

Work done.—During the year 1960-61, a sum of Rs. 500 was sanctioned by the Committee to purchase and distribute 1,200 lb. of Illuppai seeds. But actually only 660 lb. of Mahua seeds was purchased at a cost of Rs. 212 and distributed.

VII. Scheme for large scale production and distribution of castor seeds in Madras State.—The scheme for large scale production and distribution of castor seeds in Madras State was first

sanctioned in G.O. Ms. No. 2265, dated 28th June 1960, Food and Agriculture, for a period of one year, from 1960-61 at a total cost of Rs. 20,962.

Object of the scheme.—The main object of the scheme is to produce on a large scale primary seeds of the most popular strains of castor (v.z., T.M.V. 2 and T.M.V. 3), which are in great demand in this and other States so that the programme of distribution of improved seeds and extension of area under the crop envisaged under the extension scheme could be successfully carried out.

Work done.—Due to late sanction of the scheme by which time the season for procurement was almost over, the targetted quantity of seeds could not be procured. The procured seeds were issued to the District Officers for raising seedlings and for free issue to the public.

Horticultural Development.—The programme under the scheme for the year 1960-61 envisaged the grant of long term loans 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 per 3,000 acres for rejuvenation of old orchards.

A sum of Rs. 2,07,100 was sanctioned to applicants for long term loans for establishing new orchards and Rs. 47,032 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 practices.

Cashew development.—This scheme was put into operation during 1957-58. During the period under report, about 4,424 lb. of seed nuts were reported to have been distributed and these are estimated to have brought newly under cashew an area of about 1,474 acres. The scheme was discontinued with effect from 1st April 1961.

A total of 608 parent trees on the basis of yields, desirable tree and nut characters, etc., were selected during 1959-60 in six plantations in the State during the year. A total 1,37,661 lb. of seeds was procured from the parent trees for distribution under the scheme as well as outside the scheme. A total of Rs. 1,58,780 was disbursed as long term loans to 460 cultivators during the year. It is estimated that an area of 1,985 acres would have been newly brought under cashew during the year. The quantity of seed distributed under the scheme amounted to 15,278 lb. Besides, 4,500 seedlings were also distributed.

Areca nut development.—The scheme was initiated in 1957. A total of 3,850 seedlings were raised and distributed during 1960-61 against the target of 5,000 seedlings fixed for distribution annually. The nursery was operating at Shencottah temporarily.

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, Manargudi taluk of Tanjore district, Maduranthakam and Chingleput taluks of Chingleput district, Kulitalai and Karur taluks of Tiruchirappalli district, Nilakottai taluk of Madurai district, Tiruchengode taluk of Salem district, Udamalpet, Dharapuram and Coimbatore taluks of Coimbatore district. There were four Special Demonstrators for Seed Nursery Work 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, fertilisers 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 25,766 acres were worked with iron plough and 23,026 acres worked with ridge plough. Use of tractors for ploughing and trenching has become very popular especially in factory areas.

Seed and sowing.—The importance of raising of short crop nurseries for getting pure, healthy and disease free setts was stressed among the growers and 2,361 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 crops also and in all, 24,625 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 plants pure, healthy and disease free seed materials from such nurseries. The total amount disbursed

under the subsidy scheme being Rs. 2,73,108. Eighteen thousand, five hundred and sixty-nine acres were planted under proper spacing and 17,672 acres with optimum seed-rate.

Manures and Manuring.—Two to three hundred pounds of nitrogen were applied in the factory areas and in the Gur areas quantities ranging from 100 to 200 lb. were applied. The need for application of optimum quality of concentrates at the optimum time was stressed among the growers. A total of 1,210 manurial demonstration plots were laid out in the Cane Growers holdings 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. 15,750.

By intensive propaganda by the Cane Development Staff, 33,584 acres were manured with the optimum quantity of concentrates within the optimum time. A total of 10,239 acres were inter-sown with green manure and 12,484 acres were manured with outside green leaves. Ten thousand, six hundred and forty-three applications were canvassed for the grant of short term loans to cane ryots under I.M.S., out of which 9,917 applications were disposed off and a total sum of Rs. 19,32,557 was disbursed for purchase of manures and fertilisers.

Press mud was used with great advantage as manure for sugar-cane 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 989 were dug in the different centres.

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 15,633 acres.

Pine apple and mosaic diseases 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 17,577 acres and spraying, with chemicals in 15,967 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" an organo mercuric compound. This was largely done in factory areas and setts to cover 11,768 acres were pretreated before planting.

During the year the pesticides were ordered to be sold at fifty percent concessional rate through the year for sugarcane crop instead of the previous practice of restricting such concessional sale only to areas declared as "Pest Affected".

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 1823 demonstrations of constructions and repairs of improved furnaces and 1,724 demonstrations of preparation of good quality jaggery were conducted.

Sugarcane Zonal Farm, Rajadhanikottai.—This Zonal Farm started in the year 1957 was continued to be maintained. During the year, manurial, varietal and cultural trials for the main season and for the special season were conducted. During the year Co. 658 was found to give good yield of cane and sugar per acre. Application of 50 lb. of potash per acre recorded good juice quality. Varieties Co.449 and Co.467 are better suited for special season planting.

Sugarcane Zonal Farm, Lakshmangudi.—This Farm was also started during the year 1957. Co.449 was the main variety during the special season and the main season. In the Adsali observation plot it was found that Co.449 had given the highest yield of 30 tons 1810 lb. per acre. Co.951 gave the highest yield per acre of 42.08 tons in the main yield trial of early varieties followed by Co.449 and Co.658. In the Factory bye-products trial, in case of Co.419, the yield was highest in plots with Bagasse compost, and in case of Co. 449, the yield was highest in plots with Press mud at 20 tons per acre.

Road Development Scheme in the Sugar Factory Areas.—The roads leading to the Sugar Factories in the State, in many cases, are not quite fit for transporting sugarcane quickly from the ryots' field to the Factories. Any delay in the transport of cane from the field to the Factory will result in the cane drying up with consequent loss to the ryots and also national loss in the shape of less recovery per cent of sugar. A scheme for the development of roads in Sugar Factory areas has therefore been included in the Second Five-Year Plan.

During the period 1st April 1960 to 31st March 1961 a sum of Rs. 6.14 lakhs was spent towards formation and development of 15 miles, 5 furlongs and 460 feet of road construction of 27 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 eight sugar factories. During the financial year 1960-61 a sum of Rs. 21.48 lakhs was collected by way of cess.

Utilisation of Cess Fund.—The State Government's share of expenditure on the Sugarcane Research and Development Schemes during 1960-61 was met from the Cess Fund as follows:—

	LAKHS.
1 Establishment of Zonal Farms in Sugar Factory areas.	0.21
2 Gur Manufacture and storage	0.29
3 Sugarcane Research Station, Gudiyatham.	0.33
4 Sugarcane Research Station, Cuddalore ..	1.25
5 Sugarcane Research Station, Sirugamani, Tiruchirappalli district.	0.45
6 Extension work on Sugarcane Insects ..	0.08
7 Scheme for Soil survey and classification of soil in cane tracts.	0.19
8 Sugarcane Development Scheme ..	3.44
9 Road Development in Sugarcane Factory areas.	4.07
Total ..	10.31

Manures—Cattle Manure.—The importance of proper preservation of Farm Yard Manure and augmenting its supplies was stressed.

Urban Compost Scheme.—The scheme was being implemented by 64 municipalities and 270 notified panchayats besides Corporation of Madras, Mettur, Courtallam, Bhavanisagar and Kodaikanal Township Committees.

The following financial assistance was given under the scheme to local bodies during 1960-61. Loans were granted to 15 municipalities and 81 panchayats for purchase of sites, lorries and tractors for extending the scheme with a view to improve the quality and quantity of compost production.

	RS. M.P.
Loans to local bodies	9,24,100 00
Subsidy	1,30,561 20

Production and distribution.—A quantity of 3,67,256 tons of compost was produced during the year as against 3,61,386 tons produced during last year (1959-60). There has been an increase of 5,870 tons of compost. Many panchayats made efforts to secure sites and for purchase of transport vehicles as lorries, tractors, etc., step up the production. Loans were recommended to several panchayats for this purpose and revenue officials were also addressed to enable the local bodies to secure the sites expeditiously. It is expected that the production would be much more during the next year due to liberal grant of loans to the local bodies for improvement of compost work and technical help offered in the production of quality compost. Instructions were given to the local bodies to intensify the collection of waste materials required for composting with a view to step up the production to the maximum level possible. A statement showing the production and distribution of compost manure in each district during the year is given in Appendix 26. A quantity of 328,730 tons was distributed during the year as against 313,260 tons during the last year. There is an increase of 15,470 tons in the distribution of compost due to vigorous drive made by the department. 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.

(c) Government have sanctioned the payment of subsidy to local bodies and to individual ryots at the rate of 50 nP. per mile beyond three miles for every three tons of compost removed subject to a maximum subsidy of Rs. 2.

Subsidy.—A sum of Rs. 1,30,561.20 nP. was granted to local bodies towards the loss incurred on account of the sale of compost manure at the rate of Rs. 2 fixed by the Government. Particulars of district-wise production and distribution of compost manure by Municipalities during 1960-61 are furnished in Appendix 26.

II. Scheme for the Development of Local Manurial Resources.—The scheme was actually started from November, 1957 with the appointment of three Field Manure Officers at Madurai, Coimbatore and —Thanjavur for intensifying the production of quality compost in the selected National Extension Service and Community Development blocks. As the outset 81 blocks were

selected for implementation of the scheme and extended to additional number of blocks as detailed below :—

				BLOCKS.
1957-58	..	..	..	81
1978-59	..	..	..	25
1959-60	..	..	..	25
1960-61	..	..	..	31
Total				162

The scheme functioned in 162 selected blocks during 1960-61.

One Compost Inspector has been sanctioned to each selected blocks to step up the production of quality rural compost at the block level.

One additional Field Manure Officer was posted for the Madras Region in order to cope up with increased volume of work on account of extension of the scheme to additional number of blocks.

The Compost Inspectors posted to the Blocks were given special training on compost manufacture for a period of one month at the headquarters of Field Manure Officers. Key farmers were also trained in the manufacture of compost of the rate of 100 farmers per block. During the year 1960-61, a total number of 1887 key farmers were trained in the additional number of selected blocks sanctioned during this year.

The achievement under the scheme during 1960-61 is furnished below :—

(i) Number of compost pits dug	.. ..	62,047 Nos.
(ii) Number of new farm yard Manure pits dug.		57,274 ..
(iii) Quantity of rural compost obtained.		891,692 Tons.
(iv) Quantity of Farm yard Manure obtained.		631,010 ..
(v) Additional area brought under green manure by the efforts of compost Development Inspectors.		232,311 Acres.

Rural Compost Schemes.—

(i) Quantity of rural compost produced	..	397,152 Tons.
(ii) Quantity of rural compost distributed.		254,454 ..

Besides these activities, the following items of work were attended to by the Special Staff sanctioned for the scheme :—

(i) Demonstrations on efficient conservation of cattle manure and utilisation of water hyacinth and weeds from tanks for large scale composting were carried out in the blocks.

(ii) Opening of community compost yards in Government promboke lands and other common lands.

(iii) Opening of model compost and urine pits in school and farm yard manure pits in the veterinary hospitals and co-operative milk colonies.

(iv) Collection of village statistics of locally available waste materials including cattle dung and urine for working out village production plan to meet the organic manure requirements of cultivable areas under different crops.

(v) Samples of rural compost received from the Blocks were analysed and quality determined. The ryots were also advised to improve the quality of manure by adopting scientific method of composting.

III. *Scheme for the Development of Nightsoil Compost in bigger Panchayats of 2,000-4,000 population group*.—With a view to raise the present level of manure production in villages and bigger panchayats which are not now actively engaged in the manufacture of compost by conserving all the locally available resources and converting them into compost, employing improved techniques, the Government of India have extended financial assistance for implementation of a few schemes by State Governments. One of the scheme is to develop nightsoil compost in bigger panchayats coming under 2,000-4,000 population group. This scheme was implemented in the year 1957-58 and continued in the Third Five-Year Plan. Loans are granted to a maximum limit of Rs. 2,000 per panchayat with conservancy, arrangements and up to Rs. 3,600 per panchayat without conservancy arrangements, to enable the panchayats to purchase carts, sites, tools, etc., to carry the nightsoil to the composting ground and produce quality compost to step up the food production.

Advances were sanctioned to 327 panchayats during 1960-61.

Out of 805 panchayats, 740 panchayats availed themselves of the loan facilities offered by Government and a total sum of Rs. 19.6 lakhs were sanctioned to them. The achievement made during 1960-61 under the scheme for the development of nightsoil composting in bigger panchayats in 15,323 tons. A target of 150 tons per panchayat has been fixed for 1960-61. The Panchayat drawing the loan in a year will generally start production only during next year after making preliminary arrangements for purchase of site, cart and implements, etc.

So far only 259 panchayats started the production of compost. Efforts are taken by Field Manure Officers and State Compost Development Officer to visit other panchayats and bring maximum number under the scheme.

Proposals are under contemplation to conduct a competition among the panchayats for award of a shield or a cup for the best performance put up by a panchayat in each district.

IV. *Pilot Scheme for the Utilisation of Nightsoil Compost in smaller villages*.—The scheme was sanctioned in the year 1959-60. This scheme was extended to another 50 villages with a population of 1,000 and below during 1960-61. The scheme envisages a free grant of Rs. 3,500 towards non-recurring items and Rs. 350 towards recurring item. The object of the scheme is to prepare compost from nightsoil on hygienic and scientific lines in the smaller villages by constructing Wardha and Waterseal type of latrines, with the aid of the grant sanctioned. Out of this, only 41 centres in 1959-60 and 49 centres in 1960-61 drew the grant. Type designs of wardha and waterseal type of latrines as approved by the sanitary Engineer to Government were supplied to the Block Development Officers through the Field Manure Officers to enable them to construct the latrines on the approved pattern. The work of construction of latrines has been started in most of the panchayats. The other centres will undertake the work on approval of site by the District Health Officer. The Field Manure Officers are vigilantly watching this item of work and good progress is expected in the coming years.

V. *Scheme for Distribution of Bacterial cultures in Blocks*.—The scheme for the distribution of Bacterial cultures in 12 selected community development blocks was sanctioned in G.O. Ms. No. 3498, Food and Agriculture Department, dated 6th October 1959 as an experimental measure. The flasks were ordered to be sold at the rate of Rs. 3 each.

The following number of flasks were distributed under the scheme during the year 1960-61.

Block, (1)	Nature of the culture. (2)	Quantity (Number of flasks). (3)		
Madurai	Kolinji	..	..	40
	Daincha	..	..	5
Palani	Sesbania	..	..	2
	Sunhemp	..	..	5
Pappakudi	Daincha	..	..	1
	Kolinji	..	..	15
Srivilliputhur	Daincha	..	..	22
	Daincha	..	..	10

Block. (1)	Nature of the cultural. (2)	Quantity Number of flasks. (3)
Erode	Dhaincha	25
Gangavalli	Dhaincha	20
	Sunhemp	5
Musiri	Dhaincha	6
	Sunhemp	6
Total ..		162

The response for the scheme was found poor due to lack of propaganda and publicity and as the use of such bacterial cultures was not familiarised among the ryots.

Hence a modified scheme with a view to popularise the scheme in all Community Development Blocks was sanctioned in G.O. Ms. No. 1841, Food and Agriculture Department, dated 19th May 1961. As per orders the flasks to be distributed in all the 156 Community Development Blocks in which the scheme for the development of Local Manurial Resources was in operation at the rate of 10 flasks per block. The flasks were sold at Rs. 2 per flask.

The following is the progress made under this scheme during the year 1961 (up to June 1961):—

Block. (1)	Name of the bacterial culture. (2)	Quantity (Number of flasks). (3)
Madurai	Kolinji	5
Mukkudal	Daincha	7
	Sunhemp	3
Chidambaram	Sunhemp	10
Turinipuram	Indigo	22
	Sunhemp	5
Trivellore	Indigo	20
	Sunhemp	20
Srivilliputhur	Daincha	10
Erode	Daincha	20
	Kolinji	20
	Sunhemp	15
Musiri	Sunhemp	6
	Daincha	6
	Kolinji	5
Ariyatur	Sunhemp	10
	Pillipesara	10
Tuticorin at Pudukottai.	Daincha	8
Total ..		202

In order to familiarise this scheme a proposal for arranging free supplies to bacterial cultures to the ryots is under consideration.

VI. Scheme for Cattle Shed-cum-Rural Composting.—In G.O. Ms. No. 1204, Public (Rural Development Project), dated 17th April 1959, Government sanctioned a scheme with a view to give an incentive to the cultivators for the maximum utilisation of cow dung and cattle urine and other farm waste materials for composting.

A sum of Rs. 200 is granted towards loan and 25 per cent of the loan is treated as subsidy on the actual completion of the cattle shed. The scheme was continued in 50 selected blocks already sanctioned and the loan was disbursed to 2,916 cultivators, amounting to Rs. 8,57,250. A subsidy amount of Rs. 76,149 was paid up to 30th September 1961. The scheme is very popular among the villagers and it is worthwhile to extend it to all blocks for the conservation of the valuable cattle urine.

Scheme for the Distribution of Green Manure Seeds (1960-61).—The main object of the scheme is to produce adequate quantity of green manure leaves so as to cover Maximum cultivable paddy area possible. Green manure seeds are distributed and purchased from the ryots. A subsidy of 20 per cent of all in cost of the price of the green manure seeds is given by this department. A premium of Rs. 2 per maund was also paid to the ryots who delivered seeds to this department at the time of procurement. During the year 1960-61 a quantity of 1,661 metric tons of seeds were distributed to the ryots.

Fertiliser Distribution.—The purchases 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 the food production and to meet the requirements of the various crops and soil conditions, four standard mixtures have been prescribed. These mixtures are in popular demand and are being sold to public at fair prices.

(ii) Loans.—To popularise the off-take of the straight fertilisers, 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 Fertiliser Demonstration in 1954 and this is being continued annually on an extensive scale. The object of those demonstrations is to demonstrate to the cultivators, the efficacy of the chemical of 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 1960-61 for both the Kharif and Rabi seasons :—

Ammonium Sulphate, Ammonium Sulphate Nitrate, Calcium Ammonium Nitrate, Urea, Super Phosphate, Mix. No. I (12.6.0), Mix. No. II (12.6.6), Mix. No. III (6.6.12).

A large number of demonstrations are conducted every year in a limited area for each in the ryots fields so that they may themselves be convinced of the efficacy of the chemical fertilisers in increasing crop production and become fertiliser minded.

During the year 1960-61, 6,492 demonstration plots were laid in the Fertiliser Demonstration Scheme in all the districts in the State covering various crops. In all these demonstrations, manured plots have always given higher yields than the untreated plots.

These demonstrations have made the ryots fertiliser minded and the general complaint among the cultivators is that they do not get adequate supply of chemical fertiliser for application to their crops in time. In order to cater to the needs of the ryots, the rationalised distribution of fertilisers through Panchayats and Co-operatives is under consideration.

Scheme for control of pests and diseases of crops.—The Plant Protection 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 to tackling the pests and diseases of crops.

Diseases of crops.—During the year under report there was a major outbreak of late blight of potato in the Nilgiris involving an area of approximately 13,000 acres of rain crop of potato. This is a very serious disease of potato in all the potato

growing areas of the world, but was fortunately not prevalent in the Nilgiris all these years and has all of a sudden broken out in a very serious epiphytotic scale this year. Immediately on noticing the disease, the spraying campaign was organised and pesticides were supplied at concessional rates as also large number of both power operated and hand operated equipments were made available to the ryots at short notice. With all the efforts and timely action taken by the Department, the disease could not be brought under complete control as the weather conditions were very adverse since it was raining continuously all the time. This weather was very conducive for the spread of the disease while it was equally unfavourable for pushing through control operations. In spite of all these adverse conditions, the spread of the disease was very much brought under check and partial saving of the crop was effected, which otherwise would have resulted in heavy loss.

Besides this, sporadic concurrence of Blast and Helminthosporium and stem rot of paddy, Smut of cholam, Blast of Ragi, Die back, Fruit rot and leafspot of chillies, leafspot on groundnut wilt and leafspot on Banana, Die back, Cumber and deficiency diseases on Citrus, leaf blight of Onion, smut of sugarcane; sett rot of sugarcane setts, leafspot of Turmeric, blaster blight of Tea, Rust on Coffee, Wilt and leafspot of Arecanut, Mildews on Grapes, Early blight and virus of Potatoes, wilt, root rot and black arm of cotton, wilt and mildew on betelvine and leafspot and mildew on Tobacco and various other diseases of different crops were reported from different districts and these were kept under proper check by taking timely control measures by the Plant Protection Staff. During the year several concessions were given to the cultivators as was done in the previous years, to serve as an inducement to them to come forward more freely to take up control measures, particularly those poorer ryots, who could ill afford to do so, otherwise.

The following concessions were in force during the year :—

(i) Pesticides were sold at half cost till 31st March 1961 and thereafter at $\frac{3}{4}$ cost for all food crops in all areas.

(ii) Two thousand and five hundred hand operated sprayers were purchased and sold to the cultivators at concessional rate amounting to half the cost of the lowest quoted sprayer, during the year.

(iii) Pesticides were sold to the cultivators at half cost for sugarcane and oilseed crops other than coconuts during the year.

Full advantage of all the above concessions was availed of by the cultivators and the response was very good.

Seed Treatment.—Seed treatment to ward off seed borne diseases of crops like paddy, cholam, cotton, sugarcane and groundnuts was also intensified and large areas were covered by treated seeds, thereby ensuring freedom from seed borne diseases.

Several other diseases affecting the various crops like Turmeric, Banana, Betelvine, Potato, Ginger, Bhendai, Tomato, Tobacco, Mango, Tea, Coffee, Arecanut, Grapes and Onions, etc. were also effectively tackled during the period under report. Adequate stock of fungicides were maintained in all the Agricultural Depots. The existing stock of sprayer and dusters was maintained in proper working condition by replacement of worn out parts and after the addition of a mechanic to the Plant Protection Pool, the maintenance of the Plant Protection equipment in the Department has vastly improved. The dusters and sprayers of the Plant Protection Pool were properly maintained in good working condition and put to the maximum use. A tabular statement showing the areas treated by the Plant Protection Staff in the different districts is furnished in Appendix 24.

Incidence of Pests on crops.—Particularly this year, there was a very severe outbreak of Jasside (Green and White) on paddy during the months of October-November. All efforts were taken to control the pest in time. Some of the ryots who hesitated to take up control measures in time had lost their crops. However, most of the areas were treated with great difficulty. Stem-borer on paddy was next in importance. The leaf-roller, thrips, caseworm, army worm, nealy bug and rats were the other pests noticed in almost all the districts. The important pests and diseases and control measures taken are furnished in Appendix 24.

Crop Yield Competition.—Commencing from the year 1960-61, the crop yield competition on the four main crops, viz., Paddy, Cumbu, Cholam and Ragi was launched on an All-India basis, as prescribed by Government of India. The competition will be held at Village, Block, District and State levels in future. During the year 1960-61, the competition was held only at the village level. Prize winners in respect of this competition have not yet been declared in some of the districts. The following are the details of entrants enrolled and amount collected during the period under report :—

		Number of entrants.	Amount collected in Rupees.
(1)	(2)	(3)	
1 Paddy	20,062	20,202	
2 Cumbu	226	229	
3 Cholam	1,021	1,021	
4 Ragi	147	147	

2. Crop yield competition on potato was as usual confined to the Nilgiris district. As many as 170 competitors were enrolled and a sum of Rs. 170 was collected by way of entrance fees. Prize winners are yet to be declared.

3. Crop yield competition was also held on groundnut and sugarcane. The following are the numbers of competitors enrolled for them :

Groundnut	2,610
Sugarcane	548

These competitions provided a healthy rivalry among growers in increasing production and the yield from the competition plots was much higher than the average due to the special attention paid by the growers in manuring, plant protection and adoption of all improved practices recommended by the Department.

Celebration of More Milk Day.—In pursuance of the orders issued in G.O. Ms. No. 1256, Food and Agriculture, dated 4th April, 1961 the staff of this department took part in the celebration of the 'More Milk Day' organised by the Collectors and the local milk unions in the districts on 13th April 1961, the 'Tamil New Years Day' and delivered lectures on the importance of milk and methods of increasing 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)
1 Agricultural Research Station Kovilpatti.	6 Kiles.	2 94
2 Agricultural College Dairy Coimbatore.	10 lbs.	2 80

XI. VANAMAHOTSAVA.

The eleventh Vanamahotsava was celebrated throughout the State in a fitting manner in July, 1960 and Special Week in October, 1960. Meetings were held in which the necessity and the importance of tree planting were explained to the public. Many of the public took keen interest in planting the seedlings themselves and protected the planted seedlings, by live fences and others.

2. A total of 39,71,436 plants including plants, seedlings and saplings; was planted during the celebration in the whole State ---

<i>Name of the Agricultural Division.</i>	<i>Total Number of plants and trees planted.</i>
Guindy	34,946
Chingleput	1,92,420
Polur	2,14,499
Vellore	1,18,075
Cuddalore	1,85,095
Villupuram	1,00,075
Salem	3,11,236
Krishnagiri	8,63,844
Thanjavur	1,08,883
Pattukkottai	35,296
Mayuram	24,668
Kumbakonam	10,104
Tiruchirappalli (North)	56,093
Tiruchirappalli (South)	1,11,708
Madurai	84,541
Dindigul	1,91,227
Sattur	17,384
Sivaganga	43,684
Tirunelveli	72,818
Sankarankoil	53,210
Erode	53,151
Coimbatore	2,04,811
Ootacamund	3,39,864
Nagercoil	5,36,797
Total	39,71,436

XII. AGRICULTURAL MARKETING

1. *Market Surveys.*—The special scheme sanctioned during the previous year, for revising the survey reports on Marketing of different Agricultural Commodities and bringing them up-to-date, continued to operate during this year also. The district staff of the Marketing Section continued to collect data and other particulars as per the Questionnaire under the guidance of the Assistant Marketing Officer (Survey) appointed for this purpose. Particulars for survey reports and brochures were collected in respect of (i) Wheat, (ii) Pulses, (iii) Rice, (iv) Millets, (v) Gingelly and (vi) Tapioca.

The final report on 'Wheat' was compiled during the year under report. Compilation of particulars on pulses were completed and a draft report was prepared.

II. *Grading of Agricultural Produce.*—The post of a Special Assistant Marketing Officer and eight Marketing Assistants sanctioned during the previous year continued to operate during this years also for the development of grading of agricultural produce under Agmark specifications of the Government of India.

Districtwise targets were fixed for grading of all the Agricultural Commodities like ghee, gingelly oil, groundnut oil, rice, sugarcane, gur (jaggery), potatoes, eggs and sathukudi oranges under the Agricultural produce (Grading and Marketing) Act, 1937. Effective propaganda was done by the staff in the districts for achieving the targets fixed by :—

(a) Enlisting more number of fresh packers for different commodities at different centres;

(b) Inducing the existing packers to grade more; and

(c) Popularising the consumption of graded produced in both the Government and Private Institutions.

The Assistant Marketing Officer (Grading) was engaged in visiting all the districts and giving instructions to the different Marketing Assistants to improve grading activities.

The State Ghee Grading Laboratories at Coimbatore and Karur continued to grade ghee and oil during the period. The Ghee Grading Laboratory at Dharapuram was shifted to Erode during the middle of this year. Three more Ghee and Oil Grading Laboratories at Madras, Madurai and Virudhunagar were opened during this year. Sanction was also accorded by the Government to open a laboratory at Vellore for grading Jaggery and other miscellaneous articles. Separate targets were fixed for each laboratory.

The progress of grading in Madras State for different Agricultural Commodities was as follows :—

3-1 *Ghee.*—There were 25 Authorised Packers at the beginning of the period. Thirty-two more authorised packers were enlisted during the period. A quantity of 9,205.76 quintals valued at Rs. 41,12,498.88 was graded during the year as compared to 6,032 quintals valued at Rs. 40,46,000 in the previous year.

3-2 *Gingelly Oil.*—There were 6 authorised packers during the period. A total quantity of 1,966.35 quintals valued at Rs. 4,55,539.50 was graded during the period under report, as compared to 1,605 quintals valued at Rs. 3,58,000 in the previous year. With the advent of New State Laboratories, there is very good scope for larger grading of this commodity.

3-3 : *Groundnut Oil*.—Only one groundnut oil packer graded a total quantity of 1,054.77 quintals, valued at Rs. 2,69,140 during the year as against 1,175 quintals valued at Rs. 2,53,194 during the previous year.

The quantity graded is expected to go up with the starting of other private laboratories.

3-4 : *Rice*.—This year 36 packers were grading Rice under Agmark specifications as against 25 numbers of the previous year.

All the packers together graded a total quantity of 33,485.60 quintals valued at Rs. 26,78,800.00 as compared to 20,530 quintals valued at Rs. 13,82,000 during the previous year.

As a result of the special drive given a large number of fresh packers were enlisted for grading rice, and their applications for enlistment were forwarded to the Agricultural Marketing Adviser to the Government of India, Nagpur.

3-5 : *Potatoes*.—There were 39 authorised packers during the year as against 13 packers of the previous year. These parties graded a total quantity of 952 quintals valued at Rs. 33,843 as compared to 1441 quintals, valued at Rs. 71,320 during the previous year.

3-6 : *Eggs*.—There were 50 authorised packers during the year as compared to 17 packers during the previous year. All the packets together graded a total of 1,640,201 number eggs valued at Rs. 2,40,144.55 as compared to total number of 2,851,427 eggs of the previous year.

Import of gradable eggs from the Kerala State was less during the year under report and the local packers could not cope up with the demand.

3-7 : *Fruits*.—A total number of 61 packers graded sathugudies under Agmark during the year under report. They graded a total of 14,829 numbers of fruits valued at Rs. 2,197 during the period under report.

More packers for Mangoes, Sathukudi and Kamala oranges were enlisted during the period.

3-8 : *Jaggery*.—Grading of cane jaggery was in progress during the year under report. Numerous packers were enlisted in the districts. A quantity of 131.52 quintals of jaggery valued at Rs. 2,464 was graded during the year under report. They will be grading more quantity during the ensuing year. With the starting of the State Laboratory at Vellore for jaggery grading, the scope for pushing up grading of this commodity is more.

3-9 : *Others*.—Efforts to “Agmark” groundnut kernels, dry chillies, MCU 1 and MCU. 2 long staple cotton were underway.

Compulsory grading of tobacco, bristles, wool and essential oils continued in the State during the year under report under the supervision of the Special Staff of the Directorate of Marketing and Inspection.

An Agmark Packers' Association was started with the object of promoting grading of produce under AGMARK specifications. Meetings of Agmark Packers and other merchants were held. The formal inauguration of the Agmark Packers' Association was held during October 1960 under the Presidentship of the Hon'ble Minister for Agriculture, Sri Bhakthavathsalam. Dr. Punjabrao S. Deshmukh, Union Minister for Agriculture inaugurated the Association. An exhibition of Agmark Products was also opened by the Hon'ble Minister Sri Bhakthavathsalam. Special memorandum was published by the Association during this function. It may be incidentally mentioned that this Association is the first of its kind in India.

Agmark Consumers' Association.—In order to popularise Agmark products among the consuming Public it was decided to form an “Agmark Consumers' Association”. The Women's Indian Association 43rd Annual Conference was held on 6th December 1960 at Madras. The Assistant Marketing Officer (Agmark Grading) attended the meeting and addressed the gathering on the Agmark Scheme and the need to form a Consumers' Association. The first meeting of the Agmark Consumers' Association was held on the 21st December, 1960 under the presidentship of Mr. Mary Clubwala Jadhav and the District Representatives were nominated.

The inaugural function of the Association was held at the Guild of Service, Information Bureau, Government Estate, Madras-2, under the Presidentship of Sri V. Karthikeyan, I.A.S., Director of Agriculture, Madras.

The Hon'ble Minister for Agriculture Sri M. Bhaktavatsalam inaugurated Madras State Agmark Consumers' Association.

III. *Regulated Markets*.—All the Market Committees continued to function this year also, under the Madras Commercial Crops Markets Act, 1933. The number of Market Committees and the crops notified in each Committee are furnished below :—

Name of the Committee		Crops notified.
1 South Arcot Market Committee	..	Groundnut, Cotton, Gingelly.
2 North Arcot Market Committee	..	Groundnut.
3 Coimbatore Market Committee	..	Cotton, Tobacco and Groundnut.
4 Ramanathapuram Market Committee	..	Cotton and Groundnut.
5 Tiruchirappalli Market Committee	..	Groundnut and Tobacco.
6 Tirunelveli Market Committee	..	Cotton.

Twenty-six regulated markets of the different Market Committees as given below were functioning during the year.

Name of the Committee.	Number of regulated Markets.
1 South Arcot	9
2 North Arcot	8
3 Coimbatore	5
4 Trichirappalli	4
Total	26

The coverage of area under notified crops in the districts concerned, to the total acreage in the State was as hereunder :

	Area benefitted by the Act in Acs.	Total area under the Crop in the Madras State.	Percentage benefitted under the Act.
(1)	(2)	(3)	(4)
1 Cotton ..	77,3685	10,20,667	75.84
2 Groundnut..	14,30,070	19,19,692	74.52
3 Tobacco ..	28,037	47,520	58.98
4 Gingelly ..	41,121	2,78,081	14.79

The progress of work in each Market Committee during the year under report is furnished below in detail :—

A. North Arcot Market Committee.—There were eight regulated market yards under this Committee.

Sri P. K. Kandaswamy, M.A., District Revenue Officer, North Arcot district was the Ex-officio Chairman of the North Arcot Market Committee.

Regulated Market at Tiruvannamalai and Vellore continued to receive arrivals regularly throughout the period. During the season nearly 70 per cent of the total arrivals were estimated to have been purchased by the Co-operatives, Oil Millers and Traders in the district. During the period an intensive mass contact propaganda programme was conducted in Wandiwash taluk from 9th to 11th January 1961 in Arni taluk from 12th to 14th January 1961 and in Polur taluk from 16th to 18th January 1961 by the staff of the Committee to popularise the activities of the Committee and to attract arrivals to the regulated markets. As this programme was found to have yielded satisfactory results, this mass contact programme was found to have yielded satisfactory results, this mass contact programme was proposed to be continued in other taluks also during August to October 1961. (Just before the commencement of the winter crop).

The following were the arrivals of groundnut kernels during the period under report in different regulated markets.

Regulated Markets.	Arrivals in bags of 80 Kg. Kernels each.
1 Vellore	16,121
2 Tiruvannamalai	9,649
3 Wandiwash	118
4 Arni	277
5 Arcot	78
6 Tiruppathur	132
7 Gudiyatham	15
8 Polur	..

Enforcement.—The Committee continued to show satisfactory progress in the enforcement activities. The progress in respect of Licencing till June 1961 is as follows :—

Licencing under Section 5 (1)	4,037
Licencing under Section 5 (2)	3,953
Licencing of Weighmen	919
Licencing of Brokers	32

Amount collected by way of section five licence fees was Rupees 69,404, 50.

Amount collected by way of miscellaneous receipts including cess was Rs. 61,066.33.

Movement of Commercial crops.—During the period under report 3,413 permits were issued and a total quantity of 21,716 metric tons of groundnuts despatched to places outside the district.

The Committee changed over to metric units in all its Regulated Markets and it also insisted on all the Traders to change over to metric units.

Tirunelveli Market Committee.—The Market Committee was functioning under the Ex-officio Chairman who was the Revenue Divisional Officer, Koilpatti. Then the District Revenue Officer, Tirunelveli, took over the office. Election to the Five traders' and six growers' constituencies was over by the end of the year 1960.

Licence and cess.—After the revival of the activities of the Market Committee in April 1960, demand notices were given to traders to pay licence fees and cess. Cess could be collected for purchases effected from 1st July 1960 only as per Government

Memorandum No. 105865-A.III/60-1, dated 3rd October 1960. The following licence fees and cess were collected during the period :—

Licence.	Number.	Amount. Rs.
(1)	(2)	(3)
Section 5 (1) Licence fees	301	7,525-00
Section 5 (3) Licence fees	160	4,000-00
Additional premises	9	45-00
Weighman Licence	275	1,375-00
Cess on Cotton	..	11,580-31
Broker Licence	2	20-00
Cost of Weighman Badges	..	137-50

Arrivals and disposals.—From 1st July 1960 about 37,454 quintals of Karunganni cotton and 18,248 quintals of Uganda cotton were brought and sold.

South Arcot Market Committee.—The South Arcot Market Committee continued to function with nine regulated markets during the period.

Arrivals to regulated markets.—Detailed arrivals of various crops are furnished below :—

	Lots. NUMBERS.	Quantity.
(1)	(2)	(3)
1 Groundnut kernels	3,16,484	67,920 Tonnes.
2 Gingelly Seeds	31,754	35,126 Bags of 80 kgs.
3 Cotton Kapas	1,144	197 candies of 360 kgs.

Cotton Kapas, gingelly and groundnut kernal arrivals were more during this year.

Enforcement.—Particulars of licences issued are furnished below :—

Licence.	Groundnut. NUMBERS.	Gingelly. NUMBERS.	Cotton. NUMBERS.
(1)	(2)	(3)	(4)
1 Section 5 (1)	3,044	373	22
2 Section 5 (3)	2,423	95	32
3 Weighman	2,351	..	..

Coimbatore Market Committee.—Five regulated markets at the following places were functioning under this Committee :—

1. Tiruppur.
2. Pollachi.
3. Gobichettipalayam.
4. Erode.
5. Coimbatore.

This Committee was granted licences by the Central Excise authorities for opening a public bonded warehouse at Erode regulated market also, in addition to Coimbatore, Tiruppur, Pollachi and Gobichettipalayam markets for storing tobacco.

The opening stock at the beginning of the period was 1,542 quintals of Combodia Kapas and 8 quintals of Karunganni Kapas. The closing stock at the end of the period was 6,042 quintals of Cambodia Kapas and 878 quintals of Karunganni Kapas.

Weights and measures.—The stamping of weights was discontinued since 1960 owing to introduction of Metric weights in the market areas established under the Madras Commercial Crops Market Act.

Tiruchirappalli Market Committee, Tiruchirappalli.—The Tiruchirappalli Market Committee with four regulated markets at Ariyalur, Jayankondan, Alangudi and Karur continued to progress this year.

Enforcement.—The progress of licensing during the period under report is given below :—

Serial number and particulars.	Number.
1 Section 5 (1) Groundnut	466
2 Section 5 (1) Tobacco	878
3 Section 5 (3) Groundnut	323
4 Section 5 (3) Tobacco	894
5 Weighman Licence	1,053
6 Weight Stamped	1,029
7 Total Revenue	Rs. 44,002-35

Steps were taken to secure a suitable place for accommodating the proposed regulated market at Manapparai. The regulated markets of Jayankondan and Ariyalur continued to attract arrivals satisfactorily.

Ramanathapuram Market Committee.—The Market Committee continued to exercise its jurisdiction over the entire revenue district of Ramanathapuram as before.

Market Legislation on Madras Commercial Crops Markets Act and Rules Act.—The Madras Agricultural Produce Markets Act, 1959 has not yet been enforced as the rules under the Act are not yet ready. So the Madras Commercial Crops Markets Act, 1933 continued to be in force during this year also. An amended notification prescribing the rates of cess for different commodities in metric system of weights was published in G.O. Ms. No. 3765, Food and Agriculture, dated 14th November 1960. Barring this there were no further amendments during the year.

Rules.—In the Madras Commercial Crops Markets Rules, 1948, Rules 78 (a) was amended in G.O. Ms. No. 2752, Food and Agriculture, dated 9th August 1960, revising the scales of pay of Head Accountant and Senior Clerk. Rule 76 was amended in G.O. Ms. No. 2121, Food and Agriculture, dated 8th June 1961, empowering the Director of Agriculture, Madras, to permit the Market Committees to retain the whole or part of the unexpended balance of the previous year, if it was found necessary.

Amendments to Rules V and VII and new Rule XIV, Market Committee's Secretaries Service Rules were published in G.O. Ms. No. 2449, Food and Agriculture, dated 15th July 1960 regarding declaration of probation, grant of increment and maintenance of service register and personal files of the Secretaries of Market Committees.

IV. Market Intelligence.—Enquiries on market information from growers, co-operative societies and members of the trade were attended to as usual. The Directory of Merchants, Growers, Trade Unions, etc., was maintained up-to-date in this office. Weekly, fortnightly and monthly prices of all the important agricultural commodities were obtained and maintained for ready reference.

The following weekly, fortnightly and monthly reports were prepared and sent by this Section to the different departments are detailed below :—

Report.	Office to whom sent.
(a) Weekly arrivals disposals and prices of milch cattle at Tiruvottiyur.	Director of Statistics, Madras.
(b) Arrivals and prices of Cardamom in Madurai district.	Director of Statistics, Madras.
(c) Weekly Market Bulletin of Commercial Crops.	Director of Information and Publicity.
(d) Fortnightly prices of Turmeric in the Markets of Erode and Salem.	Secretary, Spice Exchange, Sangli.
(e) Monthly report of Marketing Section.	Director of Agriculture, Madras, Agricultural Marketing Adviser, Nagpur.
(f) Monthly prices of fruits and vegetables, livestock and its products.	Director of Statistics, Madras, Marketing Development Officer, Madras.
(g) Monthly report on Cotton and textiles situation in Madras State.	Director of Agriculture, Madras.
(h) Monthly chronicle reports of the Activities of the Market Committees for Publication in the Madras Agricultural Journal.	Secretary, Madras Agricultural Journal, Coimbatore-3.
(i) Monthly review of Market Conditions in Madras State.	Government through Director, of Agriculture, Madras.

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 on arrivals, disposals and prices for the benefit of the growers. These 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 Regional Assistant Marketing Officers and Market Committees. An estimated number of 800 traders, growers and officials were given expert advice and information on improved marketing methods by this office.

V. Co-operative Marketing.—The staff of this section both at headquarters and mofussil continued to contact important co-operative marketing societies and rendered all possible help in better marketing of agricultural commodities. The Tiruchirappalli Co-operative Marketing Society was enabled to maintain an Agmark grading station for rice, sathukudi, gingelly oil, ghee, potatoes and eggs.

VI. Warehousing.—The Madras State Warehousing Corporation slowly expanded its business during the year under report. At the beginning of the year there were 11 warehouses in the State. Four more warehouses were opened during this year. The following are the names of places wherein the warehouses are located with the capacity of godowns maintained by them :—

Name of the place.	Capacity of godowns in tons.
1 Vellore	630
2 Kancheepuram	450
3 Vridhachalam	528
4 Nagapattinam	335
5 Erode	300
6 Karur	843
7 Tiruchirappalli	977
8 Dindigul	905
9 Madurai	2,008
10 Rajapalayam	250
11 Tirunelveli	300
12 Tuticorin	836
13 Salem	766
14 Pollachi	963
15 Nilgiris	600

In addition to the State Warehouses, 3 Central Warehouses at Madras, Virudhunagar and Coimbatore were also functioning during this year.

Proposals are under way to open some more warehouses under the Central Warehousing Corporation.

Local advisory committees were constituted in all the above 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 due to the increase in the storage charge, availability of suitable godown accommodation on rent and other specific matters referred to them for opinion.

Transport.—Railway movement 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 also collected for all agricultural committees and livestock products.

Propaganda and publicity.—The scheme sanctioned by the Government to give fillip to the propaganda and publicity work on agricultural marketing continued to function this year also. Well organised efforts were made during the year to educate the mass regarding the advantages of selling their produce through regulated markets and grading of the agricultural commodities under Agmark Specifications.

This section participated in the Calcutta Exhibition and the All-India Khadi and Swadeshi Exhibition at Teynampet. Besides these two major exhibitions small exhibitions were conducted at Salem, Karur, Thanjavur, Aduthurai, Chidambaram, Thiruppanandal, Sankarankoil, Madurai, Tuticorin, Virudhunagar and Coimbatore.

In all the places attractive shows of graded produce, commercial samples of important agricultural commodities and attractive posters depicting the aims and advantages of Regulated Markets, Agmark Grading, etc., were displayed and these attracted a large gathering.

A museum was opened inside the premises of the State Marketing Officer's Office and attractive exhibits were kept on display inside the museum.

A drama titled "Adivanam" was written up by Sri T. Velu, the Chemistry Assistant, Madras, and put on stage at the Teynampet Exhibition. This drama on Agmark Grading was presided over by the Hon. Minister for Agriculture, Sri M. Bhakthavatsalam.

One radio talk on "AGMARK" was sent to All-India Radio for broadcasting.

Three leaflets on "Agmark Grading" and Regulated Markets were prepared by the staff of this section and sent to the Controller of Stationery and Printing for publication. They were:

1. "EDIROLI."
2. "THARAM DHANAM THARUM."
3. "THARAM PRIKKA VAREER."

Two hundred numbers of beautiful tricoloured screen printed metal boards were prepared both in English as well as in Tamil on Agmark Grading and distributed to the various co-operative societies and leading traders of the State for display in their premises.

Two Neon Sign Boards, one on "AGMARK" and the other on Regulated Markets were prepared and kept on display at the Teynampet Exhibition. Proposals are under way to fix the same permanently at the Central Station and Tiruchirappalli Junction respectively.

The long drama on Agmark Grading titled as "ADIVANAM" was published in the journal "MEZICHELIVAM" continuously. Another article titled "SENNAIL ENNAI, NEI THARAM PIRIKUM RASAYANA SALAI" was also published in the same magazine during the end of the period.

An article titled "Twenty-five Years of Scientific Marketing in Madras State" was published in Madras Agricultural Journal.

Education in Marketing.

Sri Arumugayal, B.Sc., (Ag.), who was deputed for training in Marketing at the Directorate of Marketing and Inspection, Nagpur, completed his training successfully and returned.

Sri Kesavan, B.Sc. (Ag.) and Sri Muthumani, B.Sc. (Ag.), Marketing Assistants, Madurai and Thanjavur respectively, were selected and deputed to the training for the year 1961-62.

Sri Gopalakrishnan, B.Sc. (Ag.), Marketing Assistant, Tiruchirappalli, and Sri Gopalaswamy, B.Sc. (Ag.), Marketing Assistant, Vellore, who were deputed for Secretaries' Training in Hyderabad for a period of six months were posted back to the Marketing Section after successful completion of their training.

During the period the State Marketing Officer gave lectures at Tirupathi to the Co-operative trainees on "Agricultural Marketing."

Market informations to other departments and private parties.

Information on various subjects relating to the production, supply, movement, prices and other economic aspects were supplied to different heads of departments in this State and other States. Production and marketing data on the exportable surplus of onions, chillies, groundnuts and groundnut oil were estimated in detail and furnished to the Government through Board of Revenue for working out annual export quotas.

Legislative Assembly questions on the area, productions, marketable surplus, prices, etc., were then and there answered for different Agricultural Commodities.

Scheme for the dissemination of markets news service for cardamom.—The important assembling centres such as Bodinaickanur, Thevaram, Pannaipuram, Kombai, Uthamapalayam, Cumbum, Gudalore and Pattiverranpatti in Madurai district and Virudhunagar in Ramanathapuram district were periodically visited by the Special Marketing Assistant, cardamom and weekly report on the conditions of crop, rainfall, agricultural operations, stocks arrivals, disposals, closing stock, prices, etc., of cardamom, was sent to the Director of Information and Publicity and the Director of Statistics every week.

The estimated arrivals, despatches and closing stock in respect of cardamom in Madurai district during the period were as follows :—

	LB.
1. Opening stock	54,000
2. Estimated arrivals	17,69,700
3. Estimated despatch	17,39,900
4. Closing stock	83,800

Despatches of cardamom from Bodinayackanur were mainly to Bombay, Calcutta, New Delhi, Amritsar, Kanpur, etc. Besides, large quantities were also exported to United Kingdom and other continents.

Review on market conditions.—Arrivals of paddy and rice in different markets of the State were mainly from local production. Besides, imports from Andhra State were also recorded.

Export of rice to Kerala State continued throughout the period. Prices declined from December to February and showed an upward trend during the end of the period.

Arrival of pulses was mainly from North India besides, local crop and meagre arrivals were recorded from adjacent States like Mysore and Andhra. There was gradual increase in price in different markets and the same declined during January due to local arrivals.

Arrival of pulses was mainly from North India besides, local production. There was a gradual increase in price during the period.

The arrivals of groundnut were mainly from local crops. The prices declined during December and January and increased during May and June.

The arrivals of gingelly were from local crop and from North Indian markets. An increase in price was noticed during December to February.

The arrivals of local onions were normal during the period. Exports were made to Ceylon, Malaya, Singapore, Andhra and Kerala States. Import of Bellary onions was continued.

The arrivals of chillies were from local crops. Imports from other States were also noticed. Exports to Ceylon, Kerala were continued. The prices declined during December, January due to heavy arrivals and increased from July to November.

Arrivals of tamarind were mainly from local production. Arrivals from Mysore State were also noticed. The price of tamarind has been normal.

Arrivals of cotton were mainly from local production. The fluctuations in prices of kapas and lint was not wide due to the 'Ceiling' fixed for cotton price.

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 and minor irrigation. The important activities are soil conservation, research and popularisation of improved agricultural implements, hiring and hire purchase of essential machinery such as the engine, pumpsets, tractors, sinking of filter point tube wells, artesian and sub-artesian wells and organisation of River Pumping Schemes.

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 reorganised 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.

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, bull-dozers, 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) A number of soil conservation and contour bunding measures by which lands, which have been subject to serve erosion are reclaimed levelled and bunded was also launched.

(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 Agricultural Engineering.

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 in 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.

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 institutions, without prejudice to agricultural operations.

The department was in possession of 78 bulldozers and 60 tractors. The Special Officer, who investigated the working of the Engineering Branch, recommended for the disposal of all wheel type units in the departmental fleet, as they were found uneconomical. Action is being taken to dispose them off. Besides, a Special Officer was 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 old ones having served more than their usual

period of service and as they deserve to be replaced by new ones. Orders of Government on the remarks offered by this office in regard to the recommendation of the Special Officer are awaited.

The following are the targets and achievements :—

	Virgin land.	Current fallows.
1 Target for 1960-61	8,500 acres.	12,000 acres.
2 Achievements	3,617 "	5,541 "
3 Additional production in foodgrains..	921 tons.	554 tons.

(½ and 1/10 ton for virgin and current fallows respectively).

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 were forced to be idle for want of repairs and replacements for sometime. 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 was 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 was being taken to acquire additional units of bulldozers newly out of Rs. 35 lakhs, sanctioned by Government. There was 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 hire charges in force are detailed in Appendix 16 and there were no changes in the rates during the period under report.

Agricultural Machinery Advisory Committee.—The Agricultural Machinery Advisory Committee meeting was held twice during the period under report. The dates and the subjects discussed are given below :—

1st September 1960—

(1) Consideration of quotations for purchasing oil engines, electric motors and pumps with pipes and fittings.

(2) Consideration of the tenders received for the supply of Rotary Drills.

(3) Consideration of all revised tenders for supply of 6 inches casing pipes.

(4) Consideration of tenders for supply for filter points.

(5) Collection of deposit from selected firms at Rs. 1,000 each.

(6) Introduction of new clause in the existing agreement form to be executed by the selected firm.

(7) Supply of two electric motors to one agriculturist.

5th May 1961—

- (1) Supply of one oil engine and one electric motor to the same party.
- (2) Quotation for purchase of zetor (Checkoslovakian) tractors.
- (3) Fixation of life of electric motor pumpset.
- (4) Purchase of Yugoslavaian tractors.

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 was continued temporarily and sanction for its continuance was obtained every year. Private work from agriculturists and manufacture of non-standardised article of furniture were also undertaken in the workshop.

Sanction was accorded in G.O. Ms. No. 1929, Food and Agriculture, dated 8th May 1959, for the opening of a salvage centre in the Tractor Workshop, Coimbatore, and the same was further continued during 1960-61 also.

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 was taken up during the year 1960-61 and completed. The work done at this Tractor Workshop, Coimbatore, is furnished in the appendix.

Tractor Servicing-cum-Repairing Centre, Tiruvarur.—The Centre is continuing to function under the control of Assistant Agricultural Engineer (PP), Thanjavur, assisted by the staff sanctioned for the purpose. At present only repairing and servicing of departmental units are attached to.

Regional Stores.—The two regional stores at Saidapet and Tiruchirappalli continued to function under the control of the Assistant Agricultural Engineers, Saidapet and Tiruchirappalli, respectively.

Purchase of machinery.—Action is being taken to purchase additional tractors with bulldozer attachment out of Rs. 35 lakhs sanctioned by Government.

Oil Engine Hiring Scheme.—The oil engine hiring scheme was introduced to hire out oil engines to the poor agriculturists who cannot afford to have their own pumpsets for irrigation purposes.

Two hundred and ninty units were hired out to ryots during 1960-61.

By hiring out the departmental oil engines, 4,043 acres were benefitted and the anticipated additional production is 1,344 tons.

Due to heavy loss in the working of the scheme it has been ordered by Government to wind up the scheme as per the recommendation of the Committee on Food Production.

Tractor Hire-Purchase Scheme.—This scheme is intended for assisting the middle class ryots for improving their lands by mechanical cultivation. A loan of Rs. 20,000 is being granted for the purchase and supply of a tractor with matched implements under the Tractor Hire-Purchase Scheme. This loan amount is being recovered from the hire-purchasers in seven annual equal instalments along with $3\frac{1}{2}$ per cent centage and 5 per cent interest.

Since the choice of the machinery was left to the ryot and since the popular makes of tractors were not available in the market due to restricted imports, only 19 tractors could be supplied during the year 1960-61. An area of 3,800 acres under virgin lands and 3,800 acres under current fallows was covered with anticipated additional production of 1,330 tons.

Hire-Purchase Scheme of oil engines and electric motors.—This scheme was introduced from 1949 to supply oil engines and electric motors with pipes and fittings to middle class agriculturists under the Hire-Purchase System.

The cost of the machinery is being collected in equal annual instalments ranging from three to seven years with interest and centage at 5 per cent and $3\frac{1}{2}$ per cent, respectively.

During the year 1960-61, 175 oil engines and 525 electric motors were distributed to the ryots under the scheme. This will benefit 4,025 acres with an anticipated additional production of 2,013 tons.

River Pumping Scheme.—The main object of this scheme is to utilise the water that will go waste otherwise, by sinking of wells in the river-beds and pumping the same for irrigational purposes by installing oil engines or electric motor pumpsets. This facility is extended to the ryots collectively. The scheme is sponsored in areas where the lands owned by more than 10 to 15 ryots range between 45 and 50 acres or more. Pumping machinery and staff to handle them are supplied by the department (50 per cent of cost on this is subsidised by the Central Government) and water charges are collected from the ryots to cover the interest on capital and the maintenance charges.

During the Second Five-Year Plan the River Pumping Scheme was started in the following places :—

- (1) Ooradiambalam (Pattukotai taluk).
- (2) Vadamalapuram (Ramanathapuram district).
- (3) C. Mutlur (South Arcot district).

About 30 acres of lands have been irrigated every year, by this scheme in each of the above places.

Filter Point Scheme.—One of the minor irrigation schemes provided by the State Government is the scheme for sinking of Filter Point Tube wells. The filter point is a devise for pumping out water from Sandy-Sub-Strata for Agricultural purposes. The use of Filter Point Tube wells for irrigation purposes was first introduced in the State in the year 1951-52 in Thanjavur district. The scheme was extended to seven more districts in the next year and gradually to all other districts (except Nilgiris) in the subsequent years. The scheme was in operation throughout the First Five-Year Plan period and Second Five-Year Plan and is included in the Third Five-Year Plan also.

The Filter Point Tube wells are sunk by the Agricultural Department for the ryots in their own lands after collecting a nominal fee. Loans not exceeding Rs. 2,500 are also granted for the purpose of providing pumping machinery for pumping out water from these tube wells. These loans are recovered in five equated annual instalments.

The number of wells sunk successfully during the year 1960-61 and the amount of loan spent during the above period are furnished below :—

Number of wells ..	669	} Amount of Loan spent Rs. 14.75 lakhs against the target of 15 lakhs.
against the target of ..	600	

Pumping and Boring Schemes.—The department is in possession of 32 power drills and 121 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)
Machinery H.B. Set.—		
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	
Power Drill.—		
0' — 300' 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 1,33,978'—9½".

Artesian Wells Scheme.—Scheme for sinking artesian wells is in operation in South Arcot district. Each well costs nearly Rs. 25,000 and will irrigate 150 acres. The wells are constructed by this department and then handed over to the Revenue Department for maintenance and for collecting water-rate. A water-rate of Rs. 22.50 is collected per acre per annum from the beneficiaries. Up to 31st March 1961 as against the target of 100 wells, 81 wells were completed.

Scheme for sinking of artesian wells was also taken up in Udayarpalayam taluk, Tiruchirappalli district, during 1961-62 with a target of 40 wells per year on the lines of the scheme in South Arcot district.

Bore-wells (Sub-Artesian) Scheme.—Under the scheme, wells are sunk in the ryots' holding and loan up to a maximum of Rs. 6,000 and a subsidy at 10 per cent of the loan amount are granted to the ryots in respect of each well sunk successfully under the scheme. The scheme was first introduced in South Arcot district during 1960-61 and subsequently extended to the entire State except Nilgiris in the same year. During 1960-61 loan-cum-subsidy were granted in respect of 273 cases as detailed below :—

	RUPEES IN LAKHS.
Loan	8.14
Subsidy	1.36
Total	9.50

Stock verification.—The details of verification of engineering stores by the Stock Verification Officer during the period are furnished below :—

(A) *Initial verification*—

Tractor Workshop, Coimbatore.
Research Engineers Workshop, Coimbatore.
Central Stores, Madras-21.
Regional Stores, Tiruchirappalli.
Tractor Servicing Centre, Thiruvavur.

(B) *Counter verification*—

Assistant Director (Drilling), Salem.
Assistant Agricultural Engineer, (Inspection), Vellore.
Assistant Agricultural Engineer (Inspection), Coimbatore.
Assistant Agricultural Engineer (Inspection), Madurai.

Assistant Agricultural Engineer, Inspection, Ramanathapuram at Sattur.

Assistant Agricultural Engineer, Inspection, Tiruchirappalli.

Assistant Agricultural Engineer, Inspection, Cuddalore.

(C) Counter verification by Joint Director of Agriculture (Engineering)—

Tractor Workshop, Coimbatore.

Central Stores, Madras-21.

Regional Stores, Tiruchirappalli.

Advisory Committee on agricultural implements.—The advisory committee on the agricultural implements first constituted in G.O. Ms. No. 3620, Food and Agriculture, dated 21st December 1954, was permitted to continue for two more years from 15th February 1959 in G.O. R. No. 324, Food and Agriculture, dated 5th March 1959. The Committee has also been permitted to continue for two more years from 15th February 1961 as per G.O. Ms. No. 2534, Food and Agriculture, dated 13th July 1961.

Iron and steel.—The following quantities of iron and steel were distributed under standard and non-standard materials to the agriculturist and the agricultural fabricators from the agricultural quota during 1st July 1960 to 30th June 1961.

Standard M.Tons 1,750—684.

Non-standard M. Tons 1,237—590.

Training and education.—A special lecture class on "Sorters and Graders", was taken by Assistant Agricultural Engineer (Research) for the B.Sc. (Ag.), II year in March 1961.

A batch of Block Development Officers' (under training) from Mysore State visited the Tractor Workshop at Coimbatore and the activities of this section and the details of improved agricultural implements were explained to them.

The final year B.Sc. (Ag.), students underwent training in this workshop during May-June as part of their farm training programme. The work done in the Research Engineering Workshop at Coimbatore is furnished under item 'Research'.

National Agricultural Fair, Calcutta.—The Research Engineering section took part in the National Agricultural Fair, Calcutta. Following are the outstanding exhibits displayed in the fair:—

1. Sloping platform with moving implements and background panels highlighting the actual working of 'important' improved implements.

2. Actual demonstration of machinery such as, groundnut decorticator oil seeds sheller, etc.

3. Working model of percussion type well boring machine.

4. Tape Model showing the artesian wells and tube well construction programme.

5. Filter point tube well cut model.

Deputation of Assistant Agricultural Engineer (Research) to Jammu and Kashmir States.—As per the orders of Government contained in their orders No. 1715, Food and Agriculture, dated 13th May 1960 the Assistant Agricultural Engineer (Research) along with a mechanic proceeded to Jammu and Kashmir State and the possibilities of sinking filter point tube wells were explored. A detailed report on the survey was submitted.

Scheme for Research, Testing and Training Centre in Improved Agricultural Implements, Coimbatore.—Previously a scheme for the establishment of a Research-cum-Training Centre for bullock-driven agricultural implements' was functioning in this State. Subsequently from 20th May 1960, it was continued under the revised title of "The Scheme for Research, Testing and Training Centre in Improved Agricultural Implements, Coimbatore" as per the direction of the Indian Council of Agricultural Research, New Delhi. Sanction for the continuance of the scheme has been accorded in G.O. Ms. No. 31996, Food and Agriculture, dated 6th September 1961 for the period from 1st April 1961 to 31st March 1962.

The main objectives of the scheme are as follows:—

(i) To test the bullock-drawn implements and machinery available and in use in the region under actual field conditions.

(ii) To import from foreign countries or obtaining from other parts of the country, or developing, if necessary, suitable implements and machines for certain agricultural operations for which no implements exist at present and testing them for regional conditions and requirements.

(iii) To modify or improve upon the agricultural implements and machines tested at this centre.

(iv) To design and develop simple, labour saving cheap and efficient agricultural implements and machines for the region.

(v) To introduce and popularize the farm implements and machines found suitable.

With the above objective, a technical programme of work for a period of two years from 20th May 1960 to 31st March 1962 was prepared and forwarded to the Indian Council of Agricultural

Research, New Delhi, for approval and this programme included work on the following items:—

- (1) Research studies in oil Resistance and Implements draft.
- (2) Rice transplanter.
- (3) Spraying unit.
- (4) Implements for harvesting.
- (5) Farm hand tools.
- (6) Test of imported implements.
- (7) Row seedling device for rice and other crops.
- (8) Water lifts.

XIV. SOIL CONSERVATION.

In recent years soil conservation has been recognized as a subject of national importance since it is 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 on land for cultivation which led people to break up virgin areas or slopes and vulnerable sites causing serious erosion in 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 slopes in the Nilgiris district. A beginning has also been made with the same crop in the Kodaikanal Region without necessary protective safeguards to prevent a 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 1960-61, Soil Conservation Scheme were under execution in the districts of North Arcot, South Arcot, Coimbatore, Salem, Chingleput, Nilgiris, Madurai and Tiruchirappalli.

3. It was found from experience that dry farming measures combined with contour bunding operations 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 Soil Conservation Officer 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 four batches of 95 Sub-Assistants each have already been trained and the fifth batch is undergoing their training at Coimbatore.

5. During the fasli year 1960-61, Soil Conservation Schemes were taken up in the districts of North Arcot, Salem, South Arcot, Coimbatore, Nilgiris, Madurai and Tiruchirappalli. The targets fixed and achievements made in the various districts during the period 1st July 1960 to 30th June 1961 are furnished below:—

Name of district.	Physical target in acres.	Achievement in acres.
1. Nilgiris	1,560	2,346
2. Chingleput	600	1,110
3. South Arcot	3,120	9,637
4. Madurai	4,610	7,712
5. Coimbatore	5,378	12,867
6. Salem	7,440	16,260
7. North Arcot	8,400	14,662
8. South Arcot	9,000	7,253
Total	40,106	71,847

The target fixed for the period from 1st July 1960 to 30th June 1961 has been exceeded by 79 per cent.

XV. LEGISLATION AND STATISTICS.

Weekly Cotton Mills, Press and 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 the Government of India, New Delhi, Indian Central Cotton Committee, Bombay, Secretary, East India Cotton Association, Bombay, and the Textile Commissioner, Bombay. Necessary instructions are also issued to the owners of

the ginning and pressing factories 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 correct and prompt returns.

Cotton Transport Act.—(a) *Annual General Licence.*—During the period under report, 127 licences with 5,399 certified copies were issued to the Cotton Mills for the transport of ginned cotton for the purpose of manufacture as against 122 licences and 37,773 certified copies issued during the previous year 1959-60.

(b) *Single licence by sea.*—During the period, 269 licences were issued for the transport of 32,757 bales of ginned cotton for the purpose of ginning as against 175 licences and 35,097 bales issued during the previous year.

(c) *Single licences by rail.*—Nineteen licences were issued during the period for the transport of 11 bales of kapas and 179 bales of cotton waste for the purpose of spinning as against four licences issued in the previous year for the transport of 15 bales of cotton.

(d) *Single licences by road.*—During the period 6,752 licences were issued for the transport by road of 1,58,922 bales of cotton (a bale containing 392 lb.) for the purpose of manufacture as against 3,153 licences issued for the transport of 84,714 bales of cotton in the previous year.

Fertilizer Control Order, 1957.—The Fertilizer 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 Deputy Directors of Agriculture, District Agricultural Officers, Plant Protection Assistants, Agricultural Demonstrators, the Extension Officers (Agriculture), the Revenue Divisional Officers, Tahsildars and Deputy Tahsildars of the Revenue Department act as Fertilizer Inspectors in their jurisdiction and the District Agricultural Officers act as licensing authorities and the Director of Agriculture Madras, is the registering authority for registering mixtures of fertilizers.

Ban on the inter-State movement of chemical fertilizers has been imposed by G.O. No. 610, Food and Agriculture Department, dated 27th February 1961 and was in force.

Total number of licences—

Issued—2,354.

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:

Renewed—3,701.

Receipts—Rs. 70,489.

Expenditure—Rs. 70,214.

A total of 114 registration certificates were issued for registering 267 mixtures.

The retail prices for the registered mixtures have been fixed and communicated to the mixing firms and the District Agricultural Officers. Samples numbering 300 both straight and mixed fertilizers were taken and sent to Coimbatore for analysis, by the Inspector of Fertilizers for quality control.

Twenty-six cases of contravention of the Fertiliser Control Order, were detected and prosecutions were launched against the defaulters in the Court of Law.

The Madras Agricultural Pests and Diseases Act.—This Act was enforced in respect of "Steam Weevil" and "Pink Bollworm" pests of Cambodia and Pachanadam Cotton in Madurai, Coimbatore, Tiruchirappalli and Salem Districts during 1960-61 (upto 31st March 1961) as per G.O. Ms. No. 2415, Food and Agriculture Department, dated 13th July 1960. 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 crop of exotis cottons was allowed to stand in the field after 1st September 1960. No exemption was granted to the ryots from the operation of the provision of the act.

This Act was enforced during 1960-61 (up to June 1961) in respect of Red Hairy Caterpillar pest on groundnut in North Arcot, South Arcot, Salem, Coimbatore, Madurai and Famanathapuram Districts and in the taluks of Pattukottai, Thirutturaiipondi, Mannargudi, Orathanad, Nagapattnam and Arantangi comprising the Pattukottai Agricultural Division of Thanjavur District as per G.O. Ms. 2798, Food and Agriculture, dated 11th August 1960.

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 village 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 proved beneficial to the ryots during the year.

The Madras Agricultural Pest and Diseases Act, 1919, was enforced for Sugarcane pests 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 Maistries. 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.

Chingleput.—The average rainfall received was 107 c.m. which though above normal was not equitably distributed. The semi-dry early sown crops suffered due to drought and the heavy and continuous rains received in November flooded the low lying areas resulting in damage to crops. Three State Seed Farms functioned throughout the year and one was closed in April. A quantity of 141 tons of primary paddy seeds, 3,058 tons of village seed farm seeds, 7 tons of primary and 52 tons of village seed farms millet seeds, and 139 tons of green manure seeds was distributed. The green manure seeds covered an area of 27,764 acres. An area of 2,300 acres was border planted with Sesbania and 3,72,424 numbers of green leaf yielding plants were planted. Under Cotton Extension Scheme 369 acres were newly reclaimed and brought under cotton, 2,280 acres were covered by inter-cropping, 1,070 acres by double cropping and 1,029 acres by application of fertilisers and 655 acres by distribution of improved seeds. A quantity of 35 tons of oilseeds, 9,751 coconut seedlings, 29,045 fruit plants, 845 lb. of cashew seeds and 1,256 lb. of vegetable seeds were distributed. An area of 1,97,923 acres of paddy was brought under Japanese method of cultivation. A total of 3,343 demonstration plots was laid and 205 sprayers and 19 dusters were sold at concessional rates. 7,956 tons of fertilisers were distributed. 9,030 acres of virgin land, 5,999 acres of current fallows were ploughed by tractors and 453 acres were levelled by bulldozer. Thirty-eight Filter Point Tube Wells were sunk. 3 tractors, fifteen oil engines and 3 electric motors were issued under hire purchase basis. In all 390 tons and 1,585 lb. of pesticides and fungicides were distributed to treat 1,96,380 acres against different pests and diseases.

North Arcot.—The average rainfall received was 61 c.m. but the distribution was uneven and the season was unfavourable for the entire district. The start of this monsoon was delayed and heavy and continuous rains were received in November. There were four State Seed Farms functioning at the beginning of the year and one was closed during the year leaving 3 farms at the end. A quantity of 188 tons of improved paddy seeds to cover 11,728 acres, 87 tons of millet seeds to cover 41,350 acres, 113 tons of green manure seeds bringing 17,250 acres under green manure crops, 14 tons of oil seeds covering 1,740 acres, 865 kgms. of vegetable seeds and 17,742 fruit plants were distributed. An area of 1,98,578 acres of paddy was brought under Japanese method of Paddy Cultivation and 1,381 demonstration plots were laid on the same. Nine tons of different varieties of cotton seeds were distributed and 1,251 acres were brought under cultivation. 1,05,548 acres were treated for different pests and diseases and 108 sprayers and dusters were issued to ryots at half cost. Eight oil engines and 32 electric motors were issued under Hire Purchase System. Thirty-nine filter points were sunk. As such as 254 acres of virgin land and 112 acres of current fallows were ploughed by the tractors. The parasite breeding centre working in Gudiyatham continued to function and 51,488 coconut trees were benefitted by the release of parasites.

South Arcot.—A total of 132 c.m. of rains was received during the year. South-west monsoon was normal but the rainfall during to crops. There was increase in the area under paddy due to north-east monsoon was very heavy resulting in floods and damage tanks getting completely filled up. Seven State Seed Farms were working during the year. A quantity of 2,048 tons of improved paddy seeds to cover 100,037 acres, 222 tons of millet seeds covering an area of 18,268 acres, 145 tons of green manure seeds to cover 10,266 acres, 1,382 kgm of vegetable seeds, 25, 938 coconut seedlings, 10 tons of cotton seeds to cover 1,225 acres under cotton and 14 tons of oilseeds covering 24,628 acres were distributed. An area of 858 acres was brought under cashew cultivation. As many as 2,023 demonstration plots were laid. A total area of 1,80,705 acres of paddy was brought under Japanese method of cultivation and 295 demonstration plots were laid. An area of 74,676 acres was treated against different pests and diseases. Two hundred and five sprayers and dusters were distributed to ryots at half cost. Besides ploughing 1,194 acres by tractors and five tractors, ten oil engines and six electric motors were given under hire purchase scheme and 35 filter points were sunk.

Thanjavur.—A rainfall of 154 c.m. was received during the year. Except for the continuous heavy rains during Nov.

ember, the general seasonal conditions were favourable. The heavy down pour marked with strong wind in November caused water stagnation affecting the standing crops of paddy. Low lying areas also got silted up. Twenty-four State Seed Farms were functioning during the year. During the year 856 tons of primary and 7,234 tons of village seeds farm paddy seeds to cover 3,63,100 acres, four tons of cotton seeds, 2,84,000 sugarcane setts of improved varieties, 31 tons of oilseeds, 594 tons of green manure seeds covering an area of 3,89,695 acres, 1,21,026 fruit plants, 40,269 coconut seedlings, 650 lb. of vegetable seeds and 6,84,351 seedlings and cuttings of green leaf yielding plants, were distributed. A total number of 9,549 improved implements was distributed and 3,505 demonstration plots were laid out. A total area of 6,61,421 acres of paddy was brought under Japanese method. Two hundred and eighty-seven oil engines and electric motors were supplied for fitting up to filter points and 31 numbers were given under CAES Hire Purchase Scheme. Virgin lands to the extent of 156 acres were reclaimed and 1,996 acres of current fallows were ploughed by tractors. Under the Cotton Extension Scheme, 197 acres were covered by inter-cropping and 182 acres by double-cropping. A quantity of 601 tons of pesticides and fungicides were distributed to treat 1,75,132 acres and 69,688 trees against different pests and diseases. Another 724 tons of paddy seeds were also pretreated for seed borne diseases.

Tiruchirappalli.—The season was normal with an average precipitation of 106 c.m. Nine State Seed Farms were functioning. A quantity of 180 tons of primary and 2,710 tons of village seed farms paddy seeds to cover 1,30,095 acres, 28 tons of improved millet seeds, 32 tons of oilseeds, 101 tons of green manure seeds to cover 21,340 acres, 2,89,100 seedlings and cuttings of green leaf yielding trees, 83,091 fruit plants, 14,942 coconut seedlings and 208 lb. of vegetable seeds were distributed. Under Cotton Extension Plan, 40 tons of cotton seeds were issued, 3,084 acres were covered by inter-cropping, 5,364 acres by double-cropping and 1,294 acres under reclamation of area. A total area of 1,49,645 acres of paddy was brought under Japanese method and 5,234 demonstrations were conducted. As many as 3,784 demonstration plots were laid out. Improved Implements numbering 1,812 were sold. A quantity of 1,894 tons of pesticides and fungicides were sold for treating 1,36,509 acres and 20,869 trees against different pests and 97 tons of seeds were pre-treated for seed borne diseases. One hundred filter points were rectified, 101 oil engines and electric motors under Filter Point Scheme and 27 under CAES Scheme were distributed. Under land development Schemes 1,358 acres were ploughed by tractors and 6,450 acres were covered under soil conservation scheme.

Madurai.—A total rainfall of 88 c.ms. was received and the paddy seeds covering 95,992 acres 356 tons of millet seeds covering 40,752 acres, 144 tons of green manure seeds, 680,300 seedlings, 32,256 fruit plants, 2,040 lb. of vegetable seeds and cuttings of greenleaf yielding plants, 39,057 coconut 299 tons of pesticides for treating 144,334 acres against various pests and diseases, were distributed. Forty oil engines and electric motors were issued under the Hire Purchase Scheme and 1,170 acres were ploughed by tractors.

Ramanathapuram.—A rainfall of 26 c.m. was received and the seasons was fairly normal. Four State Seed Farms were functioning at the end of the year. A quantity of 449 tons of paddy seeds covering 20,292 acres, 19 tons of millet seeds covering 4,220 acres, 116 tons of green manure seeds covering 14,534 acres, 11 tons of oilseeds, 19,297 coconut seedlings, 2,193 lb. of vegetable seeds and 72,780 fruit plants, 49 tons of pesticides and fungicides were distributed to treat 39,731 acres. Fifty-nine oil engines were given under Hire Purchase Scheme and 1,136 acres were ploughed by tractors.

Tirunelveli.—There was a rainfall of 93 c.m. which was above normal. The season was favourable for all crops, except rainfed cotton, cumbu and irrigated summer cotton which were affected by the heavy rains. During this period 1,675 tons of paddy improved seeds covering 78,870 acres, 158 tons of millet seeds covering 24,810 acres, 86 tons of green manure seeds covering 12,360 acres and 540,619 seedlings and cuttings of green leaf yielding plants were distributed. A total area of 123,045 acres of paddy was brought under Japanese method of cultivation. Further, 24,618 coconut seedlings and 25,882 fruit seedlings and 1,267 lb. of vegetable seeds were distributed. As many as 878 demonstration plots were laid out. A quantity of 145 tons of pesticides was sold to treat 68,161 acres against different pests and diseases. One hundred and thirty-five oil engines and electric motors were issued under Hire Purchase Scheme and 815 acres were covered by tractor ploughing.

Nagercoil.—The rainfall of 166 c.m. received during the year was above the normal. Continuous heavy rains caused floods and affected the standing crop especially paddy. One twin state Seed Farm was functioning. A quantity of 529 tons of paddy seeds covering 23,945 acres, 158 lb. of millet seeds, 1776 lb. of green manure seeds covering 177 acres, 42,608 coconut seedlings, 59,752 fruit plants and 305 lb. of vegetable seeds were distributed. A total of 376 demonstration plots were laid out. Twenty-nine tons

of insecticides were sold for treating 16,451 acres against different pests and diseases. Sixteen oil engines and electric motors were issued under the hire Purchase Scheme.

Salem.—A rainfall of 72 c.m. was received. The distribution was uneven and there was no rain in the later part of the year with the result that kar and samba paddy and cotton suffered. A quantity of 1,409 ons of improved paddy seeds covering 64,666 acres, 434 tons of millets seeds covering 65,881 acres, 94 tons of green manure seeds covering 16,650 acres, 84,804 fruit plants and 38 tons of oilseeds covering 2,400 acres were distributed. Under Cotton Extension Plan, 10,226 acres were brought under double-cropping, 2,319 acres under inter-cropping, 2,477 acres by reclamation of waste land and 29 tons of improved seeds covering 8,819 acres. A total area of 127,303 acres of paddy was covered by Japanese method of cultivation. Four State Seed Farms were functioning during the year. Vegetable seeds to the extent of 562 lb. were distributed, two filter points were sunk successfully. 20,414 acres were treated against different pests and diseases and 212 tons of pesticides were sold.

Coimbatore.—A total rainfall of 62 c.m. was received. The season was fairly normal excepting for the fact that crops like cotton suffered in some areas due to continuous heavy rains. There are five State Seed Farms functioning. A quantity of 784 tons of improved paddy seeds, 763 tons of millet seeds, 427 tons of cotton seeds, 115 tons of oilseeds, 83 tons of green manure seeds, 416 lb. of vegetable seeds, 42,996 fruit plants and 30,919 coconut seedlings were distributed. Under Cotton Extension Plan, 879 acres were covered by brining new area after reclamation, 714 acres by double cropping and 5,906 acres under inter-cropping. Pesticides to the extent of 658 tons were sold covering an area of 182,470 acres.

Nilgiris.—There was a rainfall of 188 c.m. and the same was not received in time. Drought in early stages and heavy rainfall later in the season adversely affected the main crop of potato. A quantity of 28 tons of improved paddy seeds, 204 lb. of millet seeds, 16,370 fruit plants, 245 kgs. of vegetable seeds, 17 tons of green-manure seeds covering 2,556 acres and 50 numbers of improved implements and 50 sprayers were distributed during the year. An area of 6,761 acres and 2,678 fruit plants were treated against different pests and diseases in addition to pre-treatment of 99 tons of potato seeds. A special campaign against late blight on potato was launched. Four tons of pesticides were distributed. Six State Seed Farms were functioning in this district.

XVII. FINANCE.

The following are the expenditure year 1960-61 along with the figures for 1959-60.

(a) Expenditure—	Total for 1959-60.	First half of 1960-61.	Second half of 1960-61.	Actuals for 1960-61.
(1)	(2)	(3)	(4)	(5)
40. Agriculture	2,75,67,128	1,03,97,455	2,03,15,707	3,07,13,162
71. Capital Outlay	2,70,291	5,507	1,02,715	1,08,222
82. Capital accounts	3,03,213	38,298	4,59,815	4,98,113
(b) Loans—				
Filter Point Scheme	6,93,038	4,74,131	10,57,984	15,32,115
Horticulture	1,76,593	1,577	2,59,353	2,80,930
Cashew Development	51,660	5,210	1,31,950	1,37,160
Urban Compost Municipalities.	5,45,450	..	6,43,500	6,43,500
Urban Compost Panchayats.	2,24,000	23,000	2,58,600	2,80,600
Development of Night soil compost.	7,16,490	11,200	9,15,700	9,26,900
Sewage utilisation	60,000	..	..	..
Cotton growers	9,79,728	97,995	7,55,849	8,53,844
Market Committees	1,04,000	75,000	1,62,000	2,37,000
Development of coconut in the Coastal area of Ramanathapuram.	2,016	1,810	15,458	17,268
Loans for raising green manure crops.	1,624	465	15,802	16,267
Soil Conservation Schemes	* 28,085	..	..	24,65,826
Loans for sinking Artesian wells.	..	3,900	7,97,864	8,01,764

* Adjustment for March 1961 final.

(b) Receipts—	Total for 1959-60.	First half of 1960-61.	Second half of 1960-61.	Actuals for 1960-61.
(1)	(2)	(3)	(4)	(5)
1. XXIX (a) Agricultural ..	28,96,108	49,58,846	95,16,605	1,44,75,451
2. XXIX (c) Agriculture ..	3,13,804	21,836	1,60,660	1,82,496
3. XXIX (d) Agriculture ..	34,405	33,261	18,419	51,680
4. XXIX (f) Agriculture ..	- 1,79,375	- 46,380	- 60,127	- 1,15,487

V. KARTHIKEYAN,
Director of Agriculture.

APPENDIX I.

Rain fall in millimetres in each month and period in 1960-61.
South-west monsoon period (June to September 1960).

District.	South-West monsoon period (June to September 1960).												Percentage departure from the normal.
	June 1960.		July 1960.		August 1960.		September 1960.		Total.		Number of rainy days.		
	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.			
(1).	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
Madras ..	48.3	44.9	91.4	63.8	116.8	32.6	119.4	274.9	375.9	416.2	26.0	+ 10.7	
Chingleput ..	49.8	84.2	83.0	102.2	126.1	79.4	131.7	215.9	396.6	481.7	26.7	+ 21.5	
South Arcot ..	45.4	66.4	72.7	134.0	136.1	69.8	143.7	133.5	397.9	403.7	20.0	+ 1.5	
North Arcot ..	61.8	65.3	86.9	202.6	133.2	72.4	165.2	259.6	417.1	599.9	28.3	+ 34.2	
Salem ..	54.5	19.1	62.5	152.4	109.2	53.4	133.5	116.8	359.7	341.7	18.4	- 5.0	
Coimbatore ..	34.8	19.2	37.2	79.6	53.1	28.1	74.4	47.6	199.5	174.5	12.1	- 12.5	
Tiruchirappalli ..	41.5	16.2	47.1	152.4	101.0	75.3	125.7	67.1	315.3	311.0	N.A.	- 1.4	
Thanjavur ..	36.3	26.1	47.5	141.0	97.5	9.5	107.4	77.9	288.7	254.5	13.8	- 11.8	
Madurai ..	33.7	17.0	34.2	139.3	69.8	40.2	83.7	82.7	226.4	279.2	15.4	+ 23.3	
Ramanathapuram ..	23.3	15.2	31.1	159.9	61.0	19.4	70.7	46.8	186.1	241.3	11.8	+ 29.7	
Tirunelveli ..	30.0	5.3	26.7	70.0	23.0	11.5	30.6	21.8*	110.3	108.6*	N.A.	- 1.5	
The Nilgiris ..	239.7	77.5	368.9	218.7	269.8	119.0	181.0	79.7	1,059.4	494.9	24.3	- 53.3	
Kanyakumari ..	209.5	55.2	121.1	205.8	68.8	50.4	84.5	133.2	483.9	444.6	34.5	- 8.1	

* = Provisional.
N.A. = Not available.

* = Provisional.

N.A. = Not available.

APPENDIX I—cont.

Rainfall in millimetres in each month and period in 1960-61—cont.
North-east monsoon (October to December 1960).

District.	North-east monsoon (October to December 1960).										Percentage departure from the normal.
	October 1960.		November 1960.		December 1960.		Total.		Number of rainy days.		
	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.			
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	
Madras ..	302.3	233.5	363.2	849.5	147.3	144.2	812.8	1,227.2	32.0	+ 51.0	
Chingleput ..	261.2	152.4	309.8	741.0	117.9	85.9	688.9	979.3	35.5	+ 42.2	
South Arcot ..	226.8	126.9	277.0	724.8	136.7	22.6	640.5	874.3	25.6	+ 36.5	
North Arcot ..	165.5	129.2	162.2	352.3	58.8	17.3	386.5	498.8	24.1	+ 29.1	
Salem ..	154.3	103.1	103.4	137.4	30.4	2.7	288.1	243.2	16.5	- 15.6	
Coimbatore ..	166.3	126.4	112.7	173.8	35.5	3.4	314.5	303.6	18.5	- 3.5	
Tiruchirappalli ..	169.7	35.9*	151.2	211.7*	74.1	11.7*	395.0	259.3	N.A.	- 34.4	
Thanjavur ..	207.0	151.5	295.2	709.1	175.5	41.4	677.7	902.0	30.6	- 33.1	
Madurai ..	185.3	153.3	155.9	298.7	57.4	11.9	398.6	463.9	21.3	- 16.4	
Ramanathapuram ..	180.4	163.8	180.9	337.7	87.5	28.4	448.8	529.9	22.1	+ 18.1	
Tirunelveli ..	170.8	168.9	205.1	429.4*	111.5	27.9	487.4	626.2	N.A.	+ 28.5	
The Nilgiris ..	253.3	200.7	175.9	218.3	66.8	11.9	496.0	431.9	24.5	- 12.9	
Kanyakumari ..	241.8	140.4	216.2	349.9	62.1	15.3	520.1	502.6	25.3	- 3.4	

APPENDIX I—cont.

Rainfall in millimetres in each month and period in 1960-61—cont.

District.	Winter period (January to February 1961).						Number of rainy days.	Percentage departure from the normal.
	January 1961.		February 1961.		Total.			
	Normal. (24)	Actual. (25)	Normal. (26)	Actual. (27)	Normal. (28)	Actual. (29)		
Madras ..	35.6	70.4	7.6	13.2	43.2	83.6	3.0	+ 93.5
Chingleput ..	32.3	41.6*	11.8	17.8	44.1	59.4	N.A.	+ 34.7
South Arcot ..	43.0	123.7	13.9	14.2	56.9	136.9	5.2	+ 140.6
North Arcot ..	23.2	16.6	8.7	4.8	31.9	21.4	2.0	- 32.9
Salem ..	11.3	49.6	7.4	9.7	18.7	59.3	4.1	+ 217.1
Coimbatore..	13.7	28.0	10.6	26.3	24.3	54.3	3.9	+ 123.5
Tiruchirappalli ..	30.0	85.3*	11.5	0.5*	41.5	85.8	N.A.	+ 106.7
Thanjavur ..	55.0	165.7	17.0	3.7	72.0	169.4	7.3	+ 135.3
Madurai ..	24.0	54.3	15.2	19.5	39.2	73.8	5.1	+ 88.3
Ramanathapuram ..	37.3	100.6*	19.3	8.4	56.6	109.0	5.2	+ 92.6
Tirunelveli ..	47.1	140.7*	30.7	0.5*	77.8	141.2	N.A.	+ 81.5
The Nilgiris ..	31.9	57.0	25.3	24.6	57.2	81.6	5.0	+ 42.7
Kanyakumari ..	24.4	65.2	20.4	33.3	44.8	98.5	5.4	+ 119.9

* Provisional.
N.A.—Not available.

* Provisional.

N.A.—Not available.

APPENDIX I—cont.

Rainfall in millimetres in each month and period in 1960-61—cont.

District.	Hot-weather period (March to May 1961).										Number of rainy days.	Total actual.	Grand normal.	Percentage departure from the normal.	Number of rainy days.
	March 1961.		April 1961.		May 1961.		Total.		Number of rainy days.						
	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.	Normal.	Actual.							
										(32)						(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)
Madras ..	7.6	..	15.2	..	25.5	22.2	48.3	22.2	1.0	- 54.0	1,280.2	1,749.2	62.0	N.A.	
Chingleput ..	8.8	..	15.5	0.2	34.0	32.4	58.3	32.6	2.1	- 44.1	1,187.9	1,553.0	53.0	53.0	
South Arcot ..	12.8	..	27.6	0.3	47.2	40.9	87.6	41.2	2.2	- 53.0	1,182.9	1,456.1	58.4	58.4	
North Arcot ..	10.1	..	23.5	3.4	66.6	59.9	100.2	62.4	3.7	- 37.7	965.7	1,182.5	45.9	45.9	
Salem ..	11.4	..	42.6	13.8	104.8	73.5	158.8	87.3	6.3	- 45.0	825.3	731.5	41.9	41.9	
Coimbatore ..	16.7	2.5	52.5	29.0	86.5	91.0	185.7	122.5	7.4	- 21.3	694.0	654.9	N.A.	N.A.	
Tiruchirappalli ..	13.1	*	41.4	7.5	74.1	53.5	128.6	61.0	N.A.	- 52.6	390.4	717.1	N.A.	N.A.	
Thanjavur ..	17.7	*	37.1	8.4*	50.2	51.5*	105.0	59.9	N.A.	- 43.0	1,143.4	1,385.0	N.A.	N.A.	
Madurai ..	21.2	6.4	60.1	39.8	74.3	74.5	155.6	120.7	6.7	- 22.4	819.8	937.6	48.5	48.5	
Ramanathapuram ..	21.7	2.1	53.5	41.0	49.7	49.1	124.9	92.2	5.1	- 26.2	816.4	972.4	44.2	44.2	
Tirunelveli ..	39.6	5.6*	56.1	98.9*	38.1	53.4*	133.8	157.9	N.A.	+ 18.0	309.3	1,033.9	N.A.	N.A.	
The Nilgiris ..	35.3	6.3	91.8	86.2	151.3	163.9	278.4	256.4	16.1	- 7.9	1,391.0	1,264.8	69.9	69.9	
Kanyakumari ..	39.6	20.0	101.8	46.9	136.2	235.5	277.6	302.4	36.1	+ 8.9	1,326.4	1,348.1	101.3	101.3	

APPENDIX 2.

Review of Grow More Food scheme.
(Figures furnished by the Board of Revenue (Food Production).)

Chemical Fertilisers—Distribution of

<i>Names of the chemical fertilisers.</i>	<i>Consumption</i>		<i>Area covered</i>		<i>Additional production</i>	
	<i>Targets for 1960-61 at the end of the II Plan.</i>	<i>Achievements in tons during 1960-61.</i>	<i>Targets in 1,000 acres for five years.</i>	<i>Achievements in 1,000 acres during 1960-61.</i>	<i>Targets in 100 tons for five years.</i>	<i>Achievements in 100 tons for five years.</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ammonium Sulphate	1,75,000	69,495	4,900	1,945	350	138
Urea	12,000	9,938	756	626	54	43
Ammonium Sulphate Nitrate.	30,000	10,474	1,080	377	75	26

Minor Irrigation scheme.

<i>Name of the scheme.</i>	<i>Expenditure in lakhs of rupees.</i>		<i>Physical Targets and Achievements.</i>	
	<i>Second plan provision in lakhs of rupees.</i>	<i>Expenditure during 1960-61 in lakhs of rupees.</i>	<i>Target (Second plan)</i>	<i>Achievement during 1960-61</i>
(1)	(2)	(3)	<i>Number of works to be completed.</i>	<i>Number of works completed.</i>
Special minor irrigation programme.	194.54	145.62	(4)	(5)
D.C.R. of Irrigation Tanks	50.00	14.98	1,775	731
New well sinking scheme	Nil	35.16	75	16
			4,890	2,809

APPENDIX 3

APPENDIX 3.

Statement showing the estimates of acreage and yield of food crops in the Madras State in 1960-61.

Crop.	Area.		Production.		Remarks.
	Acre.	Hectares.	Tons.	Tonnes.	
(1)	(2)	(3)	(4)	(5)	(6)
Cereals—					
Paddy	5,913,000	2,393,000	5,298,300	5,383,530	Yield in terms of paddy.
Cholam	1,780,300	720,400	554,300	563,200	Figures of yield of millets
Cumbu	1,237,200	500,700	312,600	318,600	are in terms of threshed
Ragi	883,600	357,600	344,800	350,300	grain.
Korra	61,800	24,900	19,100	19,600	
Varagu	638,100	258,200	276,800	281,200	
Samai	448,100	180,400	85,300	86,600	
Maize	15,200	6,200	6,600	6,700	
Other cereals (including wheat and barley)	123,670	50,048	28,540	29,002	
Total Cereals	11,098,970	4,491,448	6,927,540	7,038,632	
Pulses—					
Greengram	85,300	34,500	8,360	8,500	Figures of production of pulses are in terms of unbraked pulses. Except in the case of horsegram the estimated loss of weight in husking is 20 per cent for each of the other pulses.
Redgram	144,900	58,600	26,250	26,670	
Blackgram	109,700	44,400	14,500	14,750	
Bengalgram	3,700	1,500	800	810	
Horsegram	546,300	221,100	47,500	48,400	
Other Pulses	161,850	65,539	13,620	13,838	
Total Pulses	1,051,350	425,639	111,050	112,868	

Sugar crops—					
Sugarcane	150,100	60,740	427,340	434,200	Production is in terms of gur.
Others	57,400	23,229	55,000	56,880	
Total Sugar crops	207,500	83,969	482,340	490,080	
Condiments and spices—					
Chillies	164,700	66,700	82,300	83,600	Production is in terms of dry chillies.
Ginger	1,120	453	390	396	
Pepper	710	287	50	51	Production is in terms of dry ginger.
Others	125,900	50,950	58,050	58,982	
Total Condiments and spices	292,430	118,390	140,790	143,029	Production is in terms of black pepper.
Fruits and vegetables including root crops—					
Mangoes	57,000	23,067	150,000	152,410	
Plantains	82,300	33,306	587,180	596,600	
Onions	33,000	13,200	156,100	158,600	
Other fruits and vegetables including root crops	261,870	105,975	667,000	677,700	
Total fruits and vegetables	434,170	175,548	1,560,280	1,586,310	
Other Miscellaneous food crops	14,400	5,666	3,900	3,960	
Total Food crops	13,098,920	5,306,660	9,225,900	9,375,879	

NOTE.—Figures of area and yield in respect of paddy, cholam, cumbu, ragi, korra, varagu, samai, greengram, redgram, blackgram, bengalgram, horsegram, sugarcane, chillies, ginger, pepper and onions are according to final forecast reports issued for those crops for the year 1960-61. 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 revision when figures of area as settled at Jambandi for 1960-61 become available.

APPENDIX 4.

List of improved strains available at the beginning of the period
(i.e., 1st July 1960).

(a) PADDY.

Strains.	Number of strains	
	by pureline selection.	by hybridisation.
(1)	(2)	(3)
1 Paddy Breeding Station, Coimbatore	23	5
2 Agricultural Research Station, Aduthurai ..	22	3
3 Rice Research Station, Tirukkuppam	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 1961.
Two strains have been released (Co. 29 and Co. 30).

LIST OF IMPROVED STRAINS AVAILABLE.

(b) MILLETS.

Crops.	Number of improved strains.				Total.
	Coimbatore.	Palur.	Kovilpatti.	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
Parivaragu ..	1	..	..	..	1
Samai	1	..	..	..	1
Pulses	4	..	..	..	4

* This includes three hybrids $\times$ 1, $\times$ 2, and $\times$ 3.
List of new strains of Millet and Pulses released during the year 1960-61—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 }
A.H. 6783 } These five selections with spreading habit were tested at
A.H. 6795 } nineteen centres in Chingleput, South Arcot, Salem and
A.H. 6826 } Tiruchirappalli districts. They gave 22.1 to 53.1 per cent
A.H. 6857 } increased yields than the local varieties.

APPENDIX 4—cont.

(c) OILSEEDS—cont.

A. Groundnut—cont.

A.H. 6608 } These four semi-spreading selections were tested at seven
A.H. 6619 } centres in Mathurai and Ramanathapuram districts, where
A.H. 6614 } they recorded increased yields ranging from 21.2 to 34.3
A.H. 6615 } per cent over the local varieties.
A.H. 3490 } These four bunch selections were tested at twelve centres in
A.H. 4218 } North Arcot, Tirunelveli, Thanjavur [and] Kanyakumari
A.H. 6179 } districts, where they registered increased yields ranging
A.H. 6279 } between 3.8 and 17.8 per cent over the local bunch varieties.
A.H. 4218 } These three bunch selections, which were tried in Pollachi
A.H. 6179 } area, recorded between 51.2 and 62.9 per cent increased
A.H. 6279 } yield over the local 'Pollachi Red' groundnut.

(b) Evolved during the year—
TMV. 6 A high yielding and bold seeded strain suitable for snack
(A.H. 6719) purposes.
A.H. 6855 A spreading selection issued for district trials during 1961.

B. Jingly.

(a) Available at the beginning of the year—

TMV. 1 }
TMV. 2 } Nucleus seeds are produced for large scale multiplication and
TMV. 3 } distribution.

(b) Evolved during the year—
S.I. 1225 A selection from Gaya to be issued for district trials during
1962 summer.

C. Castor.

(a) Available at the beginning of the year—

TMV. 1 }
TMV. 2 } Nucleus seeds are produced for large scale multiplication and
TMV. 3 } distribution.

Co. 1

R.C. 1074 }
R.C. 1075 } Five short duration selections were tested at twenty centres in
R.C. 1076 } Madurai, Coimbatore, Salem and North Arcot districts,
R.C. 1146 } where they recorded an average increase of 12.5 per cent
R.C. 1147 } over the local varieties.

(b) Evolved during the year—Nil.

D. Sugarcane.

1. List of improved strains available at the beginning of the period.
Co. 419, Co. 449, and Co. 527.

2. List of improved strains released during the period.
Co. 658 has been issued for extended trials in Nellikuppam tract in about
800 acres.

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	..	..	..	P. 216 F.
5 Karunganni 2	..	..	..	K. 2.
6 Karunganni 5	..	..	..	K. 5.
7 Karunganni 6	..	..	..	K. 6.

2. List of improved strains released during the period.
The seeds of the new strain Karunganni-6 will be available for general
distribution for the next season (1961-62).
The multiplication of the new strain MCU. 3 has been taken up.

APPENDIX 5.

Estimated area covered by improved strains of crops 1960-61.

Name of the crops.	Area under the crop (in acres.)	Area covered by improved strains including natural spread (in acres.)	Percentage of spread.
(1)	(2)	(3)	(4)
Crops—			
Paddy	59,13,000	44,61,345	74
Cholam	18,59,600	10,56,465	57
Cumbu	14,90,520	9,28,960	62
Ragi	8,97,020	6,94,740	77
Minor millets ..	14,78,000	3,99,000	27
Pulses	10,83,870	3,33,000	32
Cotton—			
K. 2 } Southern tract.	3,68,400	2,23,300	83
K. 6 }		82,445	
MCU. 2	82,000	77,682	94
K. 5 } Central tract.	1,87,000	1,67,445	89
K. 6 }			
MCU. 1	3,12,600	2,65,296	85
P. 216 F	7,000	Extention is in progress.	..
Oil Seeds—			
Groundnut	20,38,800	4,27,193	21
Gingelly	2,99,300	1,32,557	44
Castor	31,800*	45,156	..
* Area under mixed cropping not included.			
Sugarcane	1,44,000	1,41,000	98

APPENDIX 6

Statement showing acre yield of various crops for the last four years.

Name of the crops.	1957-58.	1958-59.	1959-60.	1960-51.
(1)	(2)	(3)	(4)	(5)
	LBS.	LBS.	LBS.	IN KILOGRAMS.
1. Paddy.				
Short duration strains—				
1 Co. 13	2,384	1,646	1,308	519.2
2 Co. 18	2,816	2,807	2,317	509.0
3 TKM. 6	2,390	1,596	2,107	980.9
4 Co. 29	2,280	2,086	2,232	1,181.4
Average	2,468	2,034	1,991	797.6
ii. Medium duration strains—				
1 Co. 2	3,957	2,013	2,292	1,023.2
2 GEB. 24	2,288	2,495	3,155	1,419.4
Average	3,123	2,254	2,724	1,221.6
iii. Long duration strain—				
1 Co. 25	3,385	2,385	2,354	1,964.0
Average	3,385	2,385	2,354	1,964.0
2. Millets.				
	LBS.	LBS.	LBS.	LBS.
Cholam—				
Irrigated	1,920 (i)	2,040	2,500	1,883 (i)
Rainfed	105 (ii)	478	120 (ii)	256 (ii)
Cumbu—				
Rainfed	140 (ii)	763	225 (ii)	484 (ii)
Ragi—				
Irrigated	2,050	3,000	1,900	2,420
3. Cotton.				
1 Combodia	1,044	966	434	981
2 Karunganni ..	363	444	248	280
4. Oilseeds.				
1 Gingelly T.M.V. 3	430	400	429	450
2 Castor T.M.V. 1	400	440	400	450
3 Groundnut T.M.V. 1	345	342	765	636
T.M.V. 2	502	430	723	728
T.M.V. 3	410	392	806	466
T.M.V. 4	429	430	600	668
	TONS.	TONS.	TONS.	TONS.
5. Sugarcane.				
Sugarcane	31.60	37.14	37.35	33.01

APPENDIX 7.

Statement showing the second plan targets and yearwise achievements for the second plan
Head of development—Agriculture.

Serial number and name of the scheme.	Location Coverage	Item.	Unit.	Five-year physical target.	1956-57.	1957-58.	1958-59.	1959-60.	1960-61.	Total achievements for five year.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
A. Agricultural Production—										
1 Opening of State seeds farms.	Entire State	(i) Factors operating.	Numbers.	210	37	127	11	36	14	..
		(ii) Number now existing.	Numbers.	..	15	60	9	36	14	134
2 Supply schemes and Plant Protection.	Do.	Seeds distributed.	Tons	5,450	599	1,023	957	1,308	1,465	5,354
(i) Distribution of Green Manure Seeds.	Do.	Factor: Primary Seed Farms.	..	..	..	..	..	..	..	..
(ii) Supply of improved seeds of paddy and millets.	Do.	(i) Quantity distributed Village Seed Farms.	Tons	12,250	702	1,341	1,839	2,282	2,645	8,509
		(ii) Quantity distributed Millets Primary Seed Farms.	Tons	1,15,470	7,960	17,706	15,636	23,182	22,185	86,619
		(i) Quantity distributed Village Seed Farms.	Tons	2,500	31	187	164	230	341	953
		(ii) Quantity distributed Village Seed Farms.	Tons	11,500	275	1,254	1,124	2,207	2,022	6,892
3 (i) Control of pests and diseases of crops and Plant Production.	Entire State	Crop area covered.	Acres	2,45,600 each year.	4,16,600	5,74,775	8,30,796	10,08,186	11,19,539	11,19,539
(ii) Distribution of dusts and sprays.	Do.	Sprayers .. Numbers	Numbers	..	..	500	2,000	3,316	2,500	8,316
		.. ..	Numbers	..	..	200	..	..	9	209
4 Pilot scheme for destruction of rats.	Selected Blocks of the district	Acres	..	..	..	..	300	1,300	2,761	4,361

5 Japanese method of paddy cultivation.	Entire State	Area covered ..	Acres	47,45,000	6,92,000	11,67,148	10,24,264	16,76,414	21,32,000	213,200 (Cumulative figures).
6 Urban Compost Scheme.	Do.	Quantity distributed.	Tons	3,90,400	2,33,939	2,58,125	2,79,799	3,38,172	3,81,384	3,81,384
7 Development of Local Manurial Resources.	Do.	Do.	Do.	11,88,000	..	..	7,75,584	13,96,426	14,68,748	14,68,748 (Cumulative figures).
8 Development of Night Soil Compost in Bigger Panchayats.	Do.	Do.	Do.	..	..	..	..	15,289	15,323	15,323
9 Scheme for manufacture of Rural Compost.	Do.	Do.	Do.	6,72,000	1,73,411	1,27,264	1,78,264	Scheme merged with item 7 above.	..	..
10 Pilot Scheme for development of Night Soil Compost in smaller villages.	Entire State	Nightsoil compost quantity distributed.	Tons.	..	..	..	..	..	Nil	Nil
Development of Commercial Crops—										
1 Horticultural Development Scheme.	Do.	Loans ..	Bances in lakhs.	..	..	..	0.04	1.57 (L.T.)	2.18	3.74
				..	..	..	..	0.16 (S.T.)	0.44	0.60
				..	..	..	15	525 (L.T.)	711	1,251
				..	..	..	..	265 (S.T.)	680	945
				..	..	..	..	1	3	4
2 Scheme for establishment of more regional orchard-cum-nurseries.	Kodakanal, Guntakallam, Thiruvannam, Thiruvannam and Attur.	Nurseries ..	Nos.	..	..	..	..	..	..	..
3 Establishment of small scale fruit-preservation units.	Entire State	Preservation units.	Nos.	..	..	..	..	..	Scheme not implemented yet.	..
4 Scheme for training of Agricultural College and Research Institute, Coimbatore.	Agricultural College and Research Institute, Coimbatore.	Trainees ..	Nos.	50 per year	..	36	24	37	28	126

L.T. = Long term met by Government of India.
S.T. = Short term met by State Government.

APPENDIX 7—cont.

*Statement showing the Second Plan targets and yearwise Achievements for the Second Plan
Head of Development—Agriculture.—cont.*

Serial number and name of the scheme.	Location/Coverage.	Item.	Unli.	Five-year physical target.	1956-57.	1957-58.	1958-59.	1959-60.	1960-61.	Total achievements for five years.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
5 Increasing production of E. tire State ... of all seeds.		Coverage of area in acres: (i) Development Scheme, Plans etc. (ii) Extension Scheme Non-Plan Scheme.	Acres.	13,12,122	1,64,761	2,73,648	4,32,319	7,76,067	15,08,693	15,03,698 (Cumulative figures).
			Acres.	6,66,100	..	11,818	1,27,725	2,69,887	4,47,764	4,47,764 (Implemented on 1st January 1958).
6 Development of Cashew cultivation: (a) Non-forest areas.	Entire State ..	Additional production in tons: (i) Development Scheme Plans (ii) Extension scheme non-plan scheme. Lonsa distributed:	Tons.	97,500	14,803	23,283	43,584	71,906	1,46,050	1,46,050
	....	Area covered:	Tons.	1,23,000	..	2,445	23,663	43,146	39,143	39,143 (Cumulative figures).
7 Sugarcane Development Scheme.	Tiruchirappalli, Thanjavur, South Arcot, Chingleput, North Arcot, Salem, Coimbatore and Madurai Districts.	Lonsa distributed:	Rupees.	..	..	..	..	51,860	1,36,500	1,33,360
	....	Area covered:	Acres.	..	..	..	..	650	1,706	2,356
8 Road Development in sugar factory areas.	Tiruchirappalli, Thanjavur, South Arcot and Thanjavur Districts.	Improvements to roads, culverts, etc.	Lakhs ton.	10.60	1.77	2.37	2.17	2.37	3.04	11.72
			Miles.	99	..	2.00	26.4	29.6	15.5	53.2
			No.	..	..	..	..	18	27	45
9 Increasing cotton production.	Entire State ..	Additional production.	Bales of 50 lbs. each.	1,55,000	31,506	69,762	64,755	83,465	83,982	92,982 (Upto March 1961. Cumulative figures)
10 Coconut Research Station, Thanjavur.	Thanjavur District.	Incidentals farms established.	No.	2	..	1	contingency.	1	1	1
		Works.	No.	4	..	4	Do	4	4	4
11 Establishment of Coconut Nurseries.	Gudiyatham, Tindivanam, Pattukottai, Kanyakumari, Shencottah and Coimbatore, Palam, Sholavaram, Tirupurathurai and Uchipalli.	Seedlings ..	No.	..	29,998	32,951	57,548	98,965	1,25,378	3,43,935
12 Scheme for the establishment of a parasite breeding station for biological control of Nephantis Germophora.	Nagercoil .. Gudiyatham, Pattukottai, Kanyakumari, Shencottah and Coimbatore, Palam, Sholavaram, Tirupurathurai and Uchipalli.	Parasite released.	No.	25,000	..	..	7,06,732	10,96,711	29,16,789	48,49,083
			No.	25,000	..	..	16,330	10,99,380	..	..
13 Scheme for establishment of Demonstration Coconut plantation on the Kachuvai Swamp Area in Tindivanam and Uchipulli taluks.	Tindivanam, South Arcot District, Uchipulli, Kachuvai Swamp Area and Ramanathapuram District.	Centre ..	3	..	..	..	..	2	1	..
		Centre ..	1	..	..	..	..	..	..	..
14 Scheme for Development of Coconut cultivation in Ramanathapuram District.	Ramanathapuram District.	Development Part area.	Acres.	..	..	..	..	15	205	220
		Allokees	No.	..	..	..	..	3	41	44
		Nursery part—Distribution of seedlings.	No.	..	..	..	..	7,885	18,000	23,885
15 Scheme for increasing Coconut oil production.	Entire State except Nilgiris.	(i) Cultural practices. (ii) Fertilizers. (iii) Plant Protection. (iv) Irrigation facilities.	Acres.	..	..	..	..	46,651	54,081	1,00,732
			Acres.	..	..	..	..	36,949	39,888	76,837
			Acres.	..	..	..	..	35,246	51,967	87,207
			Acres.	..	..	..	..	15,804	22,514	38,318

APPENDIX 7—cont.
Statement showing the Second Plan targets and yearwise achievements for the Second Plan
Head of Development—Agriculture—cont.

Serial number and name of the Scheme.	Location Coverage.	Item.	Unit.	Five-year physical target.	1956-57.	1957-58.	1958-59.	1959-60.	1960-61.	Total achievements for five years.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10 Tobacco Research Scheme:										
(a) Meenampalayam.	Bhavaniagar, Coimbatore districts.	Institute farms established.	Nos.	1	1	1	1 (continuance.)	1	1	1
(b) Jaffna tobacco.	....	Research work.	Nos.	2	2	2	2	2	2	2
(c) Kanyakumari district.	Kanyakumari	Area ..	Acres.	..	..	..	150.84 (Tobacco Development Scheme in Kanyakumari District with the Comprehensive Scheme for Tobacco Development on 30th August 1960).	205.74	..	356.58
(d) Comprehensive scheme of Tobacco Development.	Entire State ..	Demonstration plots.	Nos.	..	..	..	..	..	80	80
	Area ..	Acres.	Acres.	..	..	..	..	..	296	296
11 Strengthening of Agricultural College, Coimbatore.										
	Coimbatore ..	Buildings ..	Percentage of works completed.	100	..	25	50	25	..	100
		Additional capacity created.	No. ..	54	54 each year.	54	54	77	54	293
		Additional students admitted.	Nos. ...	54	54	54	54	77	54	293
	Do. ..	Research work.	Nos. ..	4	2	2	2	2	2 (Continuance).	2

2 Scheme for Upgrading the Agricultural College and Research Institute, Coimbatore.
 (i) Formation of Statistical Section.
 (ii) Provision of X-Ray Unit.
 (iii) Purchase of Technical books and farm equipment.

3 Scheme for Developing the Agricultural College and Research Institute, Coimbatore, into a Regional Post-Graduate Research Institute.	Do. ..	Students trained.	Nos. ..	40 each year.	..	..	40	9	40	119
		Workers construction.	Percentage of works completed.	..	..	..	4	76	21	100

AGRICULTURAL DEPARTMENT

Agricultural Research Information and Statistics.

1 Agricultural Information Service.	Entire State ..	....	No Target.
2 Scheme for Investigation of Betelvine wilt.	Pothenur, District.	Institutions established.	Nos. ..
		Research work.	Nos. ..
3 Research on gun manufature and storage.	Gudiyatham North Arcot District.	Institutions established.	Nos. ..
		Research work.	Nos. ..
4 Scheme for manurial trial on ryots fields.	Tiruchirappalli, North Arcot, Salem, Madurai, Kanyakumari, Tirunelveli, South Arcot and Chingleput districts.	Do.	Nos. ..
5 (a) Sugarcane Station.	Cuddalore.	Institutions farms established.	Nos. ..
(b) Sugarcane farms.	Sirugamudi, Gudiyatham.	Research work.	Nos. ..
6 Regional Research Station of fruits.	Periyakulam, Madurai district.	Institution, farms established.	Nos. ..
		Research work.	Nos. ..

**Statement showing the Second Plan targets and yearwise achievements for the Second Plan
Head of Development.—Agriculture—cont.**

Serial number and name of the scheme.	Location/Coverage.	Item.	Unit.	Five-year physical target.	1956-57.	1957-58.	1958-59.	1959-60.	1960-61.	Total achievements for five years.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Agricultural Research Information and Statistics—cont.</i>										
7 Scheme for Banana Research.	Aduthural, Thanjavur district.	Institutions established.	Nos.	1	1	1	1	1	1	1
		Research work.	Nos.	5	5	5	5	5	5	5
8 Scheme for Model Agromedic experiments at Agricultural Research Station at Aduthural and Bhavanagar.	Aduthural and Bhavanagar.	Research work.	Nos.	3	3	3	3	3	3	3
9 Experimental Research Station at Amaravathi canal areas.	Physical target.	.....	.....	.....	.....	.....	.....	.....	.....	.....

No physical Targets.

New schemes included in the plan.

New schemes.

Research on grapes and related wild species.
Improvement of off-seasonal seedling in Mango.
Evolution of new varieties of dolichos lab.
Study of Nitrogen fixing.
Rice green algae in rice soil.
Production of draught resistant strains of Sorghum.
Evolution of draught resistant strains of Paddy.
Scheme for evolving paddy with resistant strains of paddy of different duration.
Stem Rot disease of rice ...

Evolution of superior and seedling resistant strains of paddy.
Evolution of paddy strains for inundated areas.
Chemical investigation of the cause of blast resistance in paddy.
Rice Stem Borer ...
Short term rice strains possessing seed dormancy.
Micro Nutrient studies in crop plants.
Rationalisation of Research stations.
Establishment of Rural Economics and Sociology Section, in the Agricultural College and Research Institute, Coimbatore.
Scheme for Co-ordinated Manurial/Fertiliser Groundnut.
Scheme for plant protection Measures on Oil seeds crops.
Establishment of an extension section at the Agricultural College and Research Institute, Coimbatore.

New schemes.

4

Land development.

1 Tractor Hiring Scheme ..	Entire State ..	Virgin (Area). Current fallows (Areas).	Acres.	4,405 20,085	4,854 15,088	4,812 9,445	5,435 9,236	4,533 7,560	21,039 61,414
2 Tractor Hire Purchase System.	Do. ..	Reclamation of lands.	Nos.	22	14	7	..	19	0
<i>Head of Development—Minor Irrigation.</i>									
1 Sinking of Tube Wells and Artesian Wells.	South Arcot district.	Artesian wells.	Nos.	100	..	..	46	35	81
2 Filter point Tube Wells.	Entire State ..	Filter Point wells.	Nos.	3,000	507	644	622	669	2,763
3 River Pumping Scheme.	Vadamarapuram, (Bamanathapuram district) and North Arcot district).	River pumping scheme.	Nos.	30	..	2	..	1	3

APPENDIX 7—cont.
Statement showing the Second Plan Targets and yearwise Achievements for the Second Plan
Head of Development Agriculture—cont.

Serial number and name of the scheme.	Location Coverage.	Item.	Unit.	Five-year physical target.	1956-57.	1957-58.	1958-59.	1959-60.	1960-61.	Total achievements for five years. (11)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
4 Lift Irrigation (Hiring) Grow More Food Scheme.	Entire State ..	Oil Engine ..	Nos.	.. Not fixed.	290	290	290	290	290	290
5 Lift Irrigation Hire Purchase Scheme.	....	Area covered.	Acres.	..	8,585	10,719	10,253	10,525	4,203	44,390
		Oil Engines ..	Nos.	..	655	70	50	184	175	559
		Electric Motors.	Nos.	..	1,785	314	171	517	475	1,675
Head of Development—Forest and Soil Conservation.										
Area in acres.										
1 Soil Conservation in Agricultural lands.	Chingleput, Chabatore, Madurai, The Nilgiris, North Arcot, Salem, Tiruchirappalli, South Arcot districts.	(i) Hills	..	7,699	851	1,244	1,891	1,332	2,434	3,305
		(ii) Plains	..	93,219	12,963	16,266	14,155	23,952	55,303	1,23,004

APPENDIX 8.

APPENDIX 8—cont.

List of agricultural schemes in progress in Madras State during 1960-61—cont.

Serial number and name of the scheme.	Place of working.	Officer-in-charge.	Object of the scheme.
(1)	(2)	(3)	(4)
A. SCHEMES FINANCED BY THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH—cont.			
21 Scheme for research on improvement of legumes and other fodders.	Agricultural College and Research Institute, Coimbatore.	Systematic Botanist and Associate Professor of Botany, Coimbatore.	Co-ordinated Scheme for Research on Fungicides.
22 Scheme for the investigation on stem rot disease of rice in Madras State.	Aduthurai	Assistant Mycologist, Aduthurai.	Do.
23 Scheme for the evolution of new varieties of dolichos lab. lab.	Agricultural College and Research Institute, Coimbatore.	Millet and Pulses Specialist Coimbatore.	Do.
24 Pilot scheme for Agronomic Research in the Black Soil Region of South India.	Tirunelveli	Assistant Agronomist, Kolpatti.	Do.
25 Scheme for evolving the breeding of particular resistant strains of paddy of different durations.	Coimbatore and Aduthurai.	Paddy Specialist, Coimbatore ..	Do.
26 Scheme for evolution of superior saline and alkaline resistance of strains.	Peravurani, Thanjavur district.	Assistant Paddy Specialist, Peruvurani.	Do.
27 Scheme for maximisation of phosphate potential in soils of Madras State.	Agricultural College and Research Institute, Coimbatore.	Agricultural Chemist and Associate Professor of Soil science, Coimbatore.	Do.
28 Scheme for micronutrient studies on crop plants.	Do.	Systematic Botanist and Associate Professor of Botany, Coimbatore.	Do.

29 Scheme for evolution of drought resistant strains of Sorghum.	Agricultural Research Station, Kolpatti.	Assistant Millets Specialist, Kolpatti.	Do.
30 Scheme for the improvement of perennial vegetables.	Agricultural College and Research Institute, Coimbatore.	Horticulturist and Associate Professor of Horticulture.	Do.
31 Scheme for the maintenance and propagation of seeds of improved ornamental plants.	Botanical Gardens, Ooty ..	Assistant Horticulturist, Ooty ..	Do.
32 Scheme for the investigation of banana diseases in Madras State.	Central Farm, Coimbatore.	Mycologist and Associate Professor of Plant Pathology, Coimbatore.	Do.
33 Co-ordinated Scheme for Research on the Study of Field rats.	Aduthurai	Assistant Entomologist, Aduthurai.	Do.
34 Scheme for the establishment of a research station for the improvement of apples in Kodalka.	Kodaikanal, Madurai district.	Assistant Horticulturist, Kodaikanal.	Do.
35 Scheme for the operational research for studying the extent to which agricultural practices are being adopted and their economics.	Coimbatore and Salem.	Investigation Officer, Coimbatore.	Do.
36 Scheme for the enquiry into economics of irrigation in Coimbatore district.	Coimbatore	District Investigation Officer, Coimbatore.	Do.

B. SCHEMES FINANCED BY THE INDIAN CENTRAL SUGARCANE COMMITTEE.

1 Scheme for the improvement of gur manufacture and storage.	Gudiyatham	Assistant Agronomist, Gudiyatham.	Do.
2 Sugarcane insect pests scheme (Merged with Central Sugarcane Research Station, Cuddalore from 1st April 1961).	Coimbatore	Assistant Entomologist	Do.

APPENDIX 8—cont.

List of agricultural schemes in progress in Madras State during 1960-61—cont.

Serial number and name of the scheme.	Place of working.	Officer-in-charge.	Object of the scheme.
(1)	(2)	(3)	(4)
B. SCHEMES FINANCED BY THE INDIAN CENTRAL SUGARCANE COMMITTEE—cont.			
3 Scheme for the establishment of Sugarcane Research Sub-station at Gudiyatham.	Sirugamani, Tiruchirappalli district.	Assistant Agronomist, Sirugamani.	Co-ordinated Scheme for research on fungicides.
4 Scheme for the establishment of a Sugarcane Research Sub-station at Gudiyatham.	Gudiyatham	Assistant Agronomist, Gudiyatham.	Do.
5 Soil Survey on Sugarcane crop and classification of dry soils contiguous to the cane tracts.	Coimbatore	Soil Survey Officer	Do.
6 Scheme for the establishment of a full fledged sugarcane research station at Nellikuppam (Cuddalore).	Cuddalore	Sugarcane Specialist, Cuddalore	Do.
7 Scheme for studies of physical and chemical Criteria of gur leading to the formulation of basic of gur grades.	Do.	Do.	Do.
C. SCHEMES FINANCED BY THE INDIAN CENTRAL COTTON COMMITTEE.			
1 Scheme for the improvement of Tinnevelles and Karunganni Cotton in Madras State.	Koilkattai and Coimbatore.	Assistant Cotton Specialist	Do.
2 Scheme for the production of extra long staple cotton of 13/16" in Madras State.	Srivilliputhur	Do.	Do.
D. SCHEMES FINANCED BY THE INDIAN CENTRAL OILSEEDS COMMITTEE.			
3 Scheme for breeding unirrigated combodia cotton of 13/16" in Madras State.	Periakulam—closed 15th September 1960.	Do.	Do.
1 Scheme for research on storage of seeds, oils and cakes of groundnut.	Coimbatore	Assistant Agricultural Chemist Coimbatore.	Do.
2 Scheme for the intensive breeding of groundnut in Madras State.	Tindivanam	Superintendent, Tindivanam	Do.
3 Scheme for research on physiology of groundnuts in Madras State.	Coimbatore	Groundnut Physiologist, Coimbatore.	Do.
4 Scheme for Fundamental research on cytology of groundnut in Madras State (closed down on 29th June 1960 a.m.)	Do.	Cytogeneticist	Do.
5 Scheme for the production of hybrid castor and for evolving short duration high yielding castor strains.	Salem	Assistant Oilseeds Specialists, Salem.	Do.
6 Scheme for the establishment of a groundnut research experimental station in Pollachi Tract.	Pollachi	Assistant Oilseeds Specialist, Pollachi.	Do.
7 Scheme for the intensive breeding of sesame.	Karur	Assistant Oilseeds Specialist, Karur.	Do.
8 Scheme for the improvement of safflower and niget in Madras State.	Koilkattai and Hosur	Assistant Oilseeds Specialist, Koilkattai.	Do.
9 Crop yield competition on groundnut.	Throughout the State except Kumbakonam, Mayuram and Nilgiris.	Oilseeds Development Officer, Coimbatore.	To step up the yield per acre of groundnut production and to enthuse the growers to go in for improved cultivation methods.

APPENDIX 8—cont.

List of agricultural schemes in progress in Madras State during 1960-61—cont.

Serial number and name of the scheme.	Place of working.	Officer in-charge.	Object of the scheme.
(1)	(2)	(3)	(4)
D. SCHEMES FINANCED BY THE INDIAN CENTRAL OILSEEDS COMMITTEE—cont.			
10 Scheme for the coordinated manual trials on groundnut in Madras State.	Tindivanam, Tiruchirappalli, Salem, Coimbatore, Srivilliputhur.	Assistant Oilseeds Specialist, Salem.	1. To find out the manual requirements of the summer crop raised under irrigation in the important irrigated area of the State. (i) To determine the manual requirements of the monsoon crop grown in the main producing areas so that fertiliser doses for general adoption might be recommended for each tract. (ii) To fix the optimum doses and combinations of nitrogen, phosphoric acid and potash required for the crop in the different groundnut growing regions and thus to enable the department to recommend an effective and economic combination of fertilizers for the crop.
11 Scheme for large scale multiplication and distribution of castor seeds in Madras State.	Coimbatore, Ramanathapuram district.	Oilseeds Development Officer, Coimbatore.	To produce on a large scale primary seeds of the most popular strains of castor (viz. TMV. 2 and TMV. 3) which are in great demand in this State and other States. To that the programme of distribution of improved seeds and extension of area could be successfully carried out under the extension scheme.

12 Scheme for procurement and free distribution Mahana (Illuppal) seedlings in Madras State.	Throughout the State...	Oilseeds Development Officer, Coimbatore.	To purchase Mahana seeds rare seedlings and distribute the same to the public.
13 Scheme for free distribution of castor seeds in Madras State.	Do.	Do.	The object of the scheme is to augment the production of castor by increasing the area. 1. In cultivable waste lands and other inferior lands which are not suitable for raising food crops. 2. As a united crop in dry lands with cumbu, cholam and other millets groundnut area. 3. On contour bunds in soil conservation scheme in dry farming areas. 4. And in forest lands and other areas which are specially reclaimed for castor cultivation.
E. SCHEMES FINANCED BY THE INDIAN CENTRAL TOBACCO COMMITTEE.			
1 Scheme for the improvement of Meenampalayam tobacco in Coimbatore district.	Bhavanisagar closed on 31st August 1960.	Superintendent, Bhavanisagar ..	Co-ordinated scheme for research on fungicides.
F. SCHEMES FINANCED BY THE INDIAN CENTRAL COCONUT COMMITTEE.			
1 Scheme for the establishment of a regional Coconut Research Station in Thanjavur district.	Veppankulam ..	Assistant Oilseeds Specialist, Pattukkottai.	Co-ordinated scheme for research on fungicides.
2 Scheme for the establishment of parasite breeding centres.	Kanyakumari District, Tirunelveli District, Thanjavur District, Coimbatore District, North Arcot district.	Crop and Plant Protection Officer, Entomology, Thanjavur. Do. Coimbatore ..	The object of the scheme is to multiply in large numbers the larval parasite. (Pentaclolephentidis) and the Pupal parasite. (Trichopilus pupivora) and release them in the pest affected gendens either in the same district or any other district where there is demand.

APPENDIX 8—cont.

List of agriculture schemes in progress in Madras State during 1960-61—cont.

Serial number and name of the scheme.	Place of working.	Officer-in-charge.	Object of the scheme.
(1)	(2)	(3)	(4)
H. SCHEMES FINANCED BY THE STATE GOVERNMENT.			
1 Scheme for soil testing laboratory at Coimbatore.	Coimbatore	 Assistant Soil Chemist, Coimbatore.	To give advice to the ryots on fertilisers 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.
2 Scheme for soil testing laboratory at Aduthurai.	Aduthurai	 Assistant Soil Chemist, Aduthurai.	Do.
3 Scheme for reconnaissance of soil survey in the ayacut area of the Parambikulam Upper Aliyar project.	Coimbatore	 Assistant Agricultural Chemist, Coimbatore.	To secure as Inventory of the soils with reference to their potential capacity for crop production.
4 Scheme for rapid multiplication and distribution of hybridumbu seeds.	Sathyamangalam	 Assistant Millets Specialist, Sathyamangalam.	Co-ordinated scheme for research on fungicides.
5 Scheme for the maintenance of nucleus seeds of improved varieties of cotton.	Cotton Breeding Station and Agricultural Research Station, Kovilpatti.	 Cotton Specialist, Coimbatore	Do.
6 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 the soils are likely to deteriorate on irrigation to recommend measures to prevent the deterioration.
7 Scheme for raising up the status of Agricultural Research Station, Pattukkottai.	Agricultural Research Station, Pattukkottai.	Superintendent, Agricultural Research Station, Pattukkottai.	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.

To educate the young farmers in all round practical training in Agricultural and allied sciences including Animal Husbandry, dairying, vegetable cultivation, plant production, etc.

To establish Model orchard-cum-Nurseries at different places in this State to visually demonstrate Agricuturists scientific methods of fruit cultivation and propagation supply of fruit plants in large numbers to meet the demands under the Fruit Development Scheme.

To multiply P 218 F variety of cotton in Tiruchirappalli District for distribution crop between two rice crops to be grown as an off season in the rice fallows of the region where this variety is becoming popular.

.. .. Superintendent, Central Farm, Agricultural College and Research Institute, Coimbatore.

Assistant Horticulturist, Fruit Development Scheme.

Salem (North)
Madurai (North)
Tirunelveli (North)
Thanjavur Chingleput
(one Model Orchard for each District).

10 Scheme for multiplication and distribution of P. 218F cotton seeds in Madras State.

Tiruchirappalli District ..

Assistant Cotton Extension Officer.

I. SCHEMES FINANCED BY THE GOVERNMENT OF INDIA AND THE GOVERNMENT OF MADRAS.

1 Scheme for establishment of an Agricultural College and Extension section at Agricultural Research Institute, Coimbatore.

The object of the scheme is to bring together the research workers and the extension workers 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 more scientific way.

APPENDIX 8—cont.

List of agriculture schemes in Madras State during, 1960-61—cont.

Serial number and name of the scheme.	Place of working.	Officer-in-charge.	Object of scheme.
(1)	(2)	(3)	(4)
H. SCHEMES FINANCED BY THE STATE GOVERNMENT.			
2 Schemes for opening a Regional Post-Graduate Training Centre at the Agricultural College and Research Institute, Coimbatore.	Agricultural College and Research Institute, Coimbatore.	Deen, 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, Coimbatore.	Agricultural College, Coimbatore.	Do.	To meet additional requirements of trained Agricultural personnel for various schemes included in Five-Year Plan schemes.
4 Scheme for integration of pre-professional course with degree course at Agricultural college and Research Institute, Coimbatore.	Agricultural College and Research Institute, Coimbatore.	Deen, Agricultural College, Coimbatore.	To integrate the pre-professional course in Agriculture with B.Sc. (Ag.) degree course of three years duration. The period of integrated B.Sc. (Ag.) Course in four years duration.
5 Scheme for the establishment of Agricultural Economics and Rural Sociology Sections at Agricultural College and Research Institute, Coimbatore.	Agricultural College and Research Institute, Coimbatore.	Do.	To expand the present Agricultural Economics sub-section and to improve the teaching in Agricultural Economics at Agricultural College and Research Institute. (Recommended by the Government of India in proposals for
6 Scheme for the development of cashew cultivation in Madras State.	Entire District except Ootacamund.	Cashew Development Officer, Thanjavur.	development of Agricultural Economics and Rural Sociology Sections in Indian Colleges of Agriculture by "Dr. D. J. Long".)
7 Scheme for the Development of Fruit Production.	Entire Madras State	Assistant Horticulturist, Fruit Development Scheme, Coimbatore.	The object of the scheme is to increase the production of cashewnut which is a dollar earning crop by extending cashewnut cultivation over 10,000 acres in the coastal districts of the Madras State during the Third-Plan Period. The extension of the area under this crop will not only help to earn foreign exchange but also improve the economic condition growers and provide increased employment to Local people.
8 Oil Seeds Development Scheme.	Throughout the State	Oil seeds Development Officer, Coimbatore.	The Chief objective of the scheme is to promote Fruit growing in the State through the issue of long term loan to intending growers for planting new orchards and their maintenances advancing short term loans for rejuvenating of old orchards by application of plant fertilisers and by adoption of plant protection measures. In addition the staff employed under the scheme are to render necessary technical guidance and assistance to the interested growers and others in the problem connected with Fruit growing.
9 To achieve an additional Production of 97,000 tons of oilseeds by the end of Second Five-Year Plan.			

APPENDIX 8—cont.

List of agriculture schemes in Madras State during 1930-61—cont.

Serial number and name of the scheme.	Place of working.	Officer in-charge.	Object of scheme.
(1)	(2)	(3)	(4)
J. SCHEMES FINANCED BY THE STATE AND INDIAN CENTRAL COTTON COMMITTEE.			
1 Scheme for the multiplication and distribution of K6 and MCU2 Cotton Seeds in Madras State.	Tirupur	Tirupur and Kovilpatti Assistant Cotton Specialist	.. The object of the scheme is to gradually replace the existing two strains K2 and K6 by KG (Pandyam) in stages within the minimum time possible.
2 Scheme for multiplication and distribution of MCU. 1 Cotton Seeds in Madras State.	Tirupur	Do.	To increase the staple length of present production of combadia cotton in the Central Districts of Coimbatore, Madurai, Salem, and Tiruchirappalli, from 7/8" to 15/16" to full one inch staples.
3 Scheme for the multiplication and distribution of Co 4 and KG Cotton Seeds in Madras State.	Do.	Do.	To convert the entire area of Central Zone i. e. Coimbatore, Salem, Tiruchirappalli and part of Madurai with K6 (Pandyam) by replacement of the existing strain K5.

K. SCHEMES FINANCED BY THE STATE GOVERNMENT AND INDIAN CENTRAL OILSEEDS COMMITTEE.

1 Oilseeds Extension Scheme ..	In the important irrigation project areas of the State.	Oilseeds Development Officer, Coimbatore.	To achieve an additional production of 1,25,000 tons of oil cells by the end of Second Five-Year Plan.
2 Scheme for running Zonal Nucleus Seeds Farms of Groundnut and Castor.	The Farms are being run in the following places. 1. Tindivanam ..	Do. One Oilseeds Development Assistant is in-charge of each farm.	To produce 1,27,625 lb. groundnut and 3,000 lb. of castor nucleus seeds, annually and to distribute for further multiplication.

2. Chittalondur (Salem District).

3. Srivilliputhur ..
4. Bhavanisagar ..
5. Pollachi ..

3 Scheme for organising Plant Protection squads in Madras State.

1. District Agricultural Officer, Coimbatore.

Intensive and extensive Plant Protection measures against pest and diseases damages groundnut. Gingelly and castors will be undertaken in the districts of Coimbatore South Arcot and Salem.

2. District Agricultural Officer Salem.
3. District Agricultural Officer, Villupuram.

APPENDIX 9.

Statement on the Achievements in Community Development and National Extension Scheme areas for the
fasis year 1960-61.

Serial number and names of the division.	Improved paddy seeds distributed.			Improved millet seeds distributed.			Fertilisers distributed.	Compost pre- pared.	Area covered by Japanese method of cultivation.
	Primary seed farm.	Village seed farm.		Primary seed farm.	Village seed farm.				
		T. LBS.	T. LBS.		T. LBS.	T. LBS.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	A.	C.
1 Nagercoil ..	34 981	364 690	0 153	..	2,659 2,160	29,189 00	17,416 00	1,27,867 00	36,88,367 00
2 Coimbatore ..	20 1,456	92 497	47 1,213	259 0,023	7,257 1,954	52,823 0,130	1,24,240 00	1,38,373 00	44,104 75
3 Kumbakonam ..	141 364	1,399 400	..	..	7,138 548	176,101 630	79,790 00	63,687 50	97,126 00
4 Mayuram ..	177 1,613	1,443 1,562	..	..	4,068 118	6,314 00	40,766 00	1,84,060 00	1,18,882 00
5 Tiruchirappalli (South)	39 430	488 213	9 1,454	30 694	2,921 2,228	5,371 1,120	67,207 00	48,000 00	4,804 00
6 Tiruchirappalli (North)	58 2,181	839 1,741	13 961	37 1,096	32,152 1,344	36 777	109,445 00	..	..
7 Guindy ..	116 832	1,436 854	3 434	30 214	3,514 189	117,678 00	..	..	..
8 Erode ..	73 453	477 205	38 507	221 360	17,652 583	87,282 00	..	..	..
9 Chingleput ..	78 434	883 388	0 925	12 965	2,462 855	54,827 00	..	..	..
10 Thanjavur ..	64 972	435 2,158	..	..	2,888 175	5,070 00	..	..	..
11 Krishnagiri ..	70 416	816 2,127	73 1,684	491 1,228	2,333 1,630	45,860 00	..	..	..
12 Ootacamund ..	26 057	147 48	..	..	316 00	12,500 00	..	..	..
13 Madurai ..	117 2100	1,250 954	26 119	240 1,497	6,260 1,891	38,796 00	..	..	..
14 Tirunelveli ..	32 886	390 122	3 544	17 778	2,244 1,133	45,463 548	..	..	..
15 Villupuram ..	84 672	540 350	3 14	79 894	9,603 2,016	22,061 1,568	..	..	..
16 Sankarankoil ..	58 156	391 00	9 011	62 120	4,187 402	41,615 00	..	..	..
17 Dindigul ..	64 2,226	486 2036	9 858	81 261	14,571 00	109,445 00	..	..	..
18 Sivaganga ..	20 2,041	216 549	4 00	7 1,581	10,748 00	25,428 00	10,781 00	..	..
19 Cuddalore ..	124 171	760 1,303	7 145	36 1,815	3,146 1,326	32,905 00	1,11,219 00	..	..
20 Polur ..	50 2,016	53 2,014	8 2,100	26 1,344	1,710 1,792	45,768 1,568	52,361 52	..	..
21 Pattukkottai ..	304 945	2,170 717	NH.	NH.	8,571 657	39,577 00	1,92,274 40	..	..
22 Vellore ..	47 2,159	639 1,134	6 708	53 1,731	2,129 1,120	39,436 00	47,298 65	..	..
23 Sattur ..	62 1,344	848 00	3 2,016	87 448	5,914 156	1,63,937 672	50,129 85	..	..
24 Salem ..	89 509	425 717	27 1,228	75 771	1, 1,503	60,22 Pits	60,671 00	..	..
Total ..	1,564 1,605	15,544 1,341	168 671	1,063 583	71,842 386	7,58,311 899	11,86,406 94	..	..

18 Sivaganga ..	20 2,041	216 549	4 00	7 1,581	10,748 00	25,428 00	10,781 00	..	..
19 Cuddalore ..	124 171	750 1,303	7 145	36 1,815	3,146 1,326	32,905 00	1,11,219 00	..	..
20 Polur ..	50 2,016	513 2,014	8 2,100	26 1,344	1,710 1,792	45,768 1,568	52,361 52	..	..
21 Pattukkottai ..	304 945	2,170 717	NH.	NH.	8,571 657	39,577 00	1,92,274 60	..	..
22 Vellore ..	47 2,159	639 1,134	6 708	53 1,731	2,129 1,120	39,436 00	47,298 65	..	..
23 Sattur ..	62 1,344	848 00	3 2,016	87 448	5,914 156	1,63,937 672	50,129 85	..	..
24 Salem ..	89 509	425 717	27 1,223	75 771	1, 1,503	60,22 Pits	60,671 00	..	..
Total ..	1,564 1,605	15,544 1,341	168 671	1,063 583	71,842 386	7,58,311 899	11,86,406 94	..	..

APPENDIX 9—cont.
Statement on the Achievements in Community Development and National Extension Scheme areas for the last year 1960-61—cont.

Name of the district	Area covered with plant protection measures. (9)	Improved implements distributed. (10)	Demonstration laid out. (11)	Coconut seedlings distributed. (12)	Fruit plants distributed. (13)	Quantity of green manure distributed. (14)	
						T.	LB.
1 Nagercoil	8,043 79 and 12,866 trees.	418	4,120	25,369	34,900	9	1651
2 Coimbatore	25,212 00	1,095	6,184	22,575	34,202	26	0041
3 Kumbakonam	36,883 67	1,892	6,467	9,210	7,836	116	439
4 Mayuram	22,492 00	2,223	6,501	3,498	5,253	106	1783
5 Tiruchirappalli (South).	49,369 00	818	976	6,963	9,447	24	581
6 Tiruchirappalli (North).	12,229 00	2,213	1,539	41,377	90,420	36	496
7 Guindy	95,852 00	2,076	4,522	6,419	18,922	72	338
8 Erode	2,934 00	1,747	3,438	15,009	17,172	89	813
9 Chingleput	60,048 00	3,596	1,168	2,456	8,120	45	711
10 Thanjavur	29,579 00 and 2,396 trees.	538	197	1,601	6,931	54	751
11 Krishnagiri	20,362 00	1,580	22,485	14,230	87,776	43	1161
12 Ootacamund	9,290 00	124	253	..	17,139	51	00
13 Madurai	95,259 00	4,439	1,269	15,927	7,823	99	342
14 Tirunelveli	14,582 77	..	..	3,257	37,272	20	990
15 Villupuram	88,592 00	1,912	167	2,859	8,179	14	568
16 Senkankoil	35,408 00	1,683	1,156	16,210	14,135	40	00
17 Dindigul	2,226 00	1,192	2,431	13,306	50,713	72	1450
18 Sivaganga	18,522 00	5,840	1,036	6,852	15,538	58	1844
19 Cuddalore	49,660 00	1,128	624	2,476	8,754	45	462
20 Polur	11,795 00	1,158	2,024	1,733	7,697	37	450
21 Pattukkottai	51,646 00	4,803	6,540	23,328	56,120	206	1541
22 Vellore	22,497 20	2,111	..	1,625	1,629	33	1570
23 Sattur	16,975 00	2,818	10,366	8,949	64,275	19	896
24 Salem	20,414 00	707	2,931	2,500	22,594	51	121
Total	836,058 60	49,934	65,435	230,375	1,819,170	1192	669

APPENDIX 10.

Name of State Seed Farms existing on 1st July 1961.

Serial number and District.	Location of State Seed Farm.	Area of farms.	Number of farms.
(1)	(2)	(3)	(4)
		AC. CENT.	
1 Chingleput	Sirukaveripakkam	50 37	2
2 Guindy	Uthukkottai	23 50	1
	Kolandalur	50 72	2
3 Polur	Athiyandal	49 69	2
	Vazhavachanur	186 32	7
4 Vellore	Navlock garden	75 88	3
5 Cuddalore	Vandarayanpattu	46 59	2
	Sethiathope	46 98	2
	Vellapakkam	89 63	3
	Vadakandal	46 29	2
	Neyveli	46 61	2
6 Villupuram	Kakuppam	38 30	2
	Vanur	49 48	2
7 Thanjavur	Kanchikudykadu	51 86	2
	Orathur	49 93	2
	Moongikudy	47 25	2
8 Pattukkottai	Deevambalpattinam	51 97	2
	Keeranthi	54 38	2
	Nedumbalam	61 68	2
	Veppankulam	51 13	2
	Sikkil	56 50	2
9 Kumbakonam	Sakkottai	30 82	1
	Maruthanallur	30 02	1
10 Mayuram	Nagamangalam	52 69	2
	Kondathur	50 12	2
	Thirukadayur	39 75	2
11 Tiruchirappalli (South).	Thirukampuliyur	30 99	1
	Thiruvarangulam	48 09	2
	Mekkudy	66 75	3
	Pudurpalayam	77 35	3
12 Dindigul	Vilpatti	44 35	2
	Rifle Range	31 32	2
	Ayyalur	49 55	2
13 Madurai	Kappalur	39 10	2
14 Sattur	Pullur	48 87	2
	Devadanam	52 07	2
15 Sivaganga	Udayachi	200 00	8
	Moriyur	32 48	2
16 Tirunelveli	Karai Irruppu	31 00	3

APPENDIX 10—cont.

Name of State Seed Farms existing on 1st July 1961—cont

Serial number and District.	Location of State Seed Farm.	Area of farms.	Number of farms.
(1)	(2)	(3)	(4)
		ACS.	
17 Sankarankoil	Manimuthar	83 88	3
18 Nagercoil	Thirupathisaram	50 74	2
19 Erode	Bhavanisagar	50 29	2
	Satyamangalam	41 35	2
	Bhavani	76 50	3
20 Coimbatore	Kannampalayam	49 51	2
	Pongalur	27 71	1
	Samathur	78 99	3
21 Krishnagiri	Danishpet	111 90	4
	Paparapatty	45 81	2
22 Salem	Mulluvadi	70 00	2
23 Nilgiris	Thumanetty	24 59	1
	Kakathope	29 96	1
	Kurthukuly	100 63	4
	Vijayanagarar	39 53	2
	Doddabetta	11 55	1
	Colgrain	51 00	2
	Killur	38 92	2
	Baroda Palace	25 00	1
Total ..		3,238 24	180

APPENDIX 11.

Quantity of seeds produced at the State Seed Farms and distributed for the period from 1st July 1960 to 30th June 1961.

Serial number and name of seed.	Quantity produced.	Quantity distributed.
(1)	(2)	(3)
	TON. LB.	TON. LB.
1 Paddy	1,793 1196	1,511 136
2 Cholam	26 365	26 390
3 Cumbu	32 992	14 1832
4 Ragi	59 2045	36 1008
5 Other Millet	14 312	3 1,813

APPENDIX 11—cont.

Quantity of seeds produced at the State Seed Farms and distributed for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and name of seed.	Quantity produced.		Quantity distributed.	
(1)	(2)		(3)	
	TON.	LB.	TON.	LB.
6 Groundnut ..	93	1445	108	129
7 Castor	0	1594	1	546
8 Gingelly	4	68	2	1264
9 Cotton	35	1476	52	138
10 Vegetable .. .	0	2008	1	138
11 Potato	851	1719	570	562
12 Green Manure ..	22	1526	49	1652
13 Wheat	0	1171	0	449
14 Ginger	3	980	..	..

APPENDIX 12.

Statement showing the targets and achievements under area and production of cotton during 1959-60 and 1960-61.

Serial number and particulars.	Area in acres, 1959-60.		Area in acres, 1960-61.		Production in bales, 1959-60.		Production in bales, 1960-61.	
(1)	Target.	Achievement.	Target for 12 months.	Achievement (9 months only).	Target.	Achievement.	Target for 12 months.	Achievement (9 months only).
I. Extensive cultivation—								
(a) Reclamation of fallow on waste lands.	10,000	12,572	9,620	15,096	2,500	3,143	2,405	3,774
(b) By replacement of crops ..	57,000	31,098	88,000	28,438	28,500	15,549	44,000	14,219
(c) Double cropping	73,500	32,948	81,000	35,114	36,750	16,474	40,950	17,557
II. Intensive cultivation—								
(a) Inter-cropping	80,000	55,464	89,700	53,400	10,000	6,933	11,213	6,875
(b) Distribution of improved seeds ..	367,500	311,216	487,700	374,250	14,700	12,450	19,508	14,970
(c) Application of fertilizers	214,000	138,016	225,800	180,456	26,750	17,252	28,236	22,537
(d) Plant protection measures	480,000	335,040	292,400	200,680	6,000	4,188	3,654	2,578
(e) Improved cultivation methods ..	64,000	298,960	403,900	133,320	800	3,737	5,044	1,654

APPENDIX 13.

Statement showing the district wise distribution of tractors and bulldozers as on 30th June 1960.

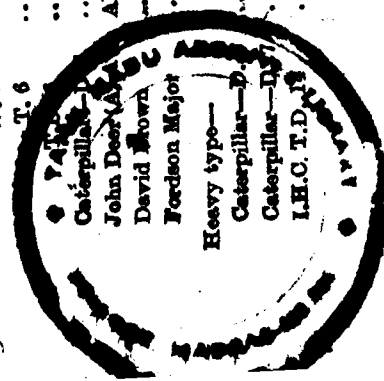
District.	(1)	Tractor type tractors with bulldozers.	Tractor type tractors without bulldozers.	Wheel type tractors.	Total.
North Arcot	..	7	..	3	10
Chingleput	..	6	1	6	13
South Arcot	..	4	..	12	16
Thanjavur 4.	..	14	..	4	18
Tiruchirappalli	..	5	..	8	13
Madurai	..	4	..	7	11
Tirunelveli	..	3	..	5	8
Ramanathapuram	..	5	..	7	12
Salem	..	6	..	..	8
Coimbatore	..	12	..	3	15
Nilgiris	..	12	..	..	12
Kanyakumari	..	..	..	..	..
Superintendent, Agricultural Research Station, Tindivanam	..	..	..	1	1
Total	..	78	1	58	137

AGRICULTURAL DEPARTMENT

APPENDIX 14.

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- power.	(2)	Tractors with bull- dozers.	(3)	Tractors without bulldozers.	(4)	Wheel type tractors.	(5)	Total.	(6)
Small type--											
Mecormic Deering W. 4	..	25	..	..	..	..	..	2	..	2	2
Massey Harris 20 K.	..	22	..	..	..	..	..	8	..	8	8
Massey Harris 30 K.	..	18.5	..	..	..	..	..	7	..	7	7
Medium type--											
I.H.C. W.D. 9	..	40	..	..	..	..	..	4	..	4	4
T.D. 9	..	46	..	3	..	..	..	..	..	3	3
W. 6	..	30	..	..	..	..	..	15	..	15	15
T. 6	..	30	..	14	..	..	1	..	..	15	15
AR and HC Models)	..	34	..	4	..	..	..	..	..	4	4
Caterpillar--	..	45	..	14	..	..	..	..	..	14	14
John Deere (A, B, C)	..	40	..	..	..	..	..	10	..	10	10
David Brown	..	25	..	..	..	..	..	9	..	9	9
Fordson Major	..	30	..	..	..	..	..	3	..	3	3
Heavy type--											
Caterpillar--D	..	60	..	23	..	..	..	..	..	23	23
Caterpillar--D	..	75	..	11	..	..	..	..	..	11	11
I.H.C. T.D. 13	..	65	..	9	..	..	..	..	..	9	9
Total	..		..	78	..	..	1	58	..	137	137



APPENDIX 15.

Statement showing the type and models of tractors with Agricultural Department as on 30th June 1960.

Year.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1959-60	I.H.C. con- sisting of T. 6, T.D. 6, T. D. 8, W. D. 9, W. 4, W. 6 and T. D. 14.	52	John consisting of HO, A, A W and A.R. models.	Caterpillar con- sisting of D4, D6 and D7.	Maasey Harris consisting of 20K and 30 K.	Fordson Major.	David Brown	Total.
			10	48	15	2	9	137

APPENDIX 16.

Statement showing districtwise out-turn of tractors and bulldozers for the period from 1st July 1960 to 30th June 1961.

Serial number and name of the district.	(1)	Total num- ber of hours bulldozers work.	Total out-turn in acres.	
			Virgin.	Current follows.
			A. C. (3)	A. C. (4)
1 North Arcot	..	(2)		
2 Chingleput	..	5,674	471 40	137 50
3 South Arcot	..	1,988½	378 01	586 70
4 Thanjavur ..	..	608½	67 25	1,108 50
5 Tiruchirappalli	..	1,883½	199 50	95 60
6 Madurai ..	..	3,753½	987 00	293 00
7 Ramanathapuram	..	1,812	162 19	579 25
8 Tirunelveli	..	939	397 40	656 49
9 Salem ..	..	1,297	14 00	293 50
10 Coimbatore	..	4,260	272 45	418 02
11 Nilgiris ..	..	14,364	699 25	1,052 50
	..	12,727	18 45	320 15
Total ..		52,086½	3,646 90	5,541 21

APPENDIX 17.

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.	5 per acre.	Rs.	10 per acre.	Rs.	12 per acre.	Rs.	12 per acre.
Ploughing by all types of tractors	..	..	..	..	..	..	..	..	..
Ploughing shallow ploughing	..	..	..	..	..	..	..	..	..
Levelling with bulldozers—	..	..	..	..	..	..	..	..	..
D-7 Type	..	..	..	..	..	..	..	..	..
D-6	..	..	..	..	..	..	..	..	..
TD-14	..	..	..	..	..	..	..	..	..
TD-9	..	..	..	..	..	..	..	..	..
TD-6	..	..	..	..	..	..	..	..	..
T-6	..	..	..	..	..	..	..	..	..
D-4	..	..	..	..	..	..	..	..	..

APPENDIX 18.

Statement showing the acreage tackled by the departmental tractors from 1st July 1960 to 30th June 1961.

	Virgin.	Current fallows.
1 Target in acres	8,000	12,000
2 Outturn in acres	4,533	7,560
3 Number of hours worked by the bulldozers.		52,086½ hours.
4 Additional foodgrains in tons (½ ton and 1/10 ton per acre for virgin and current fallows).	1,133	756
5 Number of tractors with bulldozers and without bulldozers—		
With Bulldozers ..	79	
Without Bulldozers ..	58	
	137	
6 Number of bulldozers	79	
7 Hire charges collected during the year—	Rs. 7,84,243.33	

APPENDIX 19.

Statement showing tractors and implements available with the Department as on 30th June 1960.

Particulars.	Number available.	
1 Tractors	Track type 79 Wheel type 59	137
2 Bulldozers attachments		78
3 Mould board plough and harrows		88
4 Disc harrows, ploughs, cultivators and tillers, seed drills, etc.		144
5 Rotavators		8

APPENDIX 20.

Statement showing the jurisdiction of Assistant Agricultural Engineers and officers in-charge of engineering activities including pumping and boring sections as on 30th June 1961.

(1) Serial number and name of Assistant Agricultural Engineer and headquarters.	(2) 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.

APPENDIX 20—cont.

Statement showing the jurisdiction of Assistant Agricultural Engineers and officers in-charge of engineering activities including pumping and boring sections as on 30th June 1961—cont.

Serial number and name of Assistant Agricultural Engineer and headquarters.	Name of district or districts in his jurisdictions.
(1)	(2)
4 Assistant Agricultural Engineer (Package Programme), Thanjavur.	Thanjavur Division. All Engineering activities and in-charge of tractor hiring scheme for the entire district and in-charge of tractor workshop, Tiruvarur. In respect of filter point and CAES, the District Agricultural Officer, Pattukottai, Mayuram and Kumbakonam are in charge of these schemes in respect of their divisions.
5 Assistant Agricultural Engineer, Madurai, Madurai.	Madurai and Ramanathapuram districts.
6 Assistant Agricultural Engineer, Tirunelveli, Tirunelveli.	Tirunelveli and Kanyakumari districts.
7 Assistant Agricultural Engineer, Coimbatore, Coimbatore.	Coimbatore and Nilgiris district.
8 Assistant Director of Drilling, Salem.	Salem district.

APPENDIX 21.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
1 Manufacturing of G.I. rods (For making valve seat sleeves).	2 Nos.	48 80
2 Manufacturing G.M. rods	3 .	72 16
3 Manufacturing self starter bush for van MDC 1103.	2 Nos.	10 52
4 Manufacturing self starter bush for jeep MDC 8516.	2	7 69
5 Manufacturing bush for D7. 3926	2	20 44
6 Manufacturing furnace plate in size 18" x 12" x 1/4" with 3/8" holes of drills.	3	54 68
7 Manufacturing clutch links for D7 P.No. 241023.	1	481 87
8 Manufacturing clutch links for D6	25	410 20
9 Manufacturing and supply of one shaft as per sample.	1	27 86
10 Manufacturing and supply of one bush as per sample.	1	35 92
11 Manufacturing and supply of one bush as per sample.	1	11 74
12 Manufacturing and supply iron rings to size.	72	48 13
13 Manufacturing mandal for DD. 10 drill ..	1	35 84
14 Manufacturing shaft for pump well No. 40.	1	34 76

APPENDIX No. 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
15 Manufacturing bush (G.M. for pump well No. 40).	3 Nos.	60 22
16 Manufacturing studs (for pump flanges) ..	6	6 76
17 Manufacturing self starter bushes for dynamo bush for jeep MDC 8350.	4	36 13
18 Manufacturing one bush adj. sleeve as per sample.	1	31 78
19 Manufacturing bolt 4 1/2" length 1/2" thick with nut and washers.	2	6 00
20 Manufacturing adjustment needle for carburetor of D7.	4	9 26
21 Manufacturing dynamo bush for 20 K M.H. Tractor.	1	4 40
22 Manufacturing dynamo bush for jeep 4203.	1	10 88
23 Manufacturing nipple 5/16" size for wheel cylinder of jeep 4203.	1	14 57
24 Manufacturing G.M. Bearing for spudding arm of C.P.D.1.	1 Set.	31 50
25 Manufacturing G.M. rods in various sizes ..	5	118 36
26 Manufacturing and supply of collar for pump in well No. 50.	1	11 48
27 Manufacturing foundation bolt for pump in well No. 50.	1	13 20
28 Manufacturing 'D' bolt and nut for lorry MSZ 2419.	2	48 88
29 Manufacturing pitman pulley shaft for P.D.9 drill.	3	52 70
30 Manufacturing G.M. rods in various sizes ..	9	167 78
31 Manufacturing bushes for springs of jeep 8350.	4	17 80
32 Manufacturing bushes for jeep 4203	3	8 77
33 Manufacturing valve stem collars	1	8 92
34 Manufacturing fuel tank gauge for measuring fuel in tanks.	10	14 78
35 Manufacturing recoil spring bolt with nut.	..	432 36
36 Manufacturing water line flange for jeep MDC 8350.	1	28 26
37 Manufacturing master pin for D-4. tractor.	..	118 84
38 Manufacturing the moulding bore	2	15 40
39 Manufacturing clutch lever bracket	1	20 38
40 Manufacturing recoil spring bolt with nuts.	6	220 90
41 Manufacturing wooden side block of DD. 5.	4	21 45
42 Manufacturing engine drill support flange ..	2	35 75
43 Manufacturing sand line pin	1	10 51
44 Manufacturing pump bearing bush	1	20 48
45 Manufacturing gland bush	2	18 92

APPENDIX 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.	
(1)	(2)	(3)	
		RS. NP.	
46 Manufacturing link bush of DD. 6	1	19 05	
47 Manufacturing spudding sleeve bush of DD. 6.	1	39 58	
48 Manufacturing 24" disc harrow pin	1	16 36	
49 Manufacturing master pin of D. 6	4	15 86	
50 Manufacturing recoil spring bolt of D.6 ..	3	118 44	
51 Manufacturing master pin	8	20 99	
52 Manufacturing studs to the stay of the hydraulic lifters M.H.P.E. 65.	..	..	
53 Manufacturing clutch pad screws	4	21 95	
54 Manufacturing inlet ball valves of plat man jerk hammer.	1	6 87	
55 Manufacturing keys of jack shaft and sand line key for DD. 6.	6	68 14	
56 Manufacturing bush of pump shaft set and nuts collar rings key for the shaft.	6	48 44	
57 Manufacturing washer of sprocket nut of D7. 3894.	2	23 06	
58 Manufacturing clamp for D. 4	6	21 15	
59 Manufacturing starter bush of jeep MDC 3362.	2	6 85	
60 Manufacturing yoke pin for D7. 3872	4	3 84	
61 Manufacturing the extension of D4	6	102 04	
62 Manufacturing washer for D7. 3890 (14" thick).	16	14 24	
63 Manufacturing heel shaft of DD. 6	1	183 94	
64 Manufacturing fitting of D7. 3894	1	10 52	
65 Manufacturing hydraulic pump collar of D4.	6	11 06	
66 Manufacturing grease nipple adopter for D7.	3	19 42	
67 Manufacturing steering lever knob for D7 ..	2	13 51	
68 Manufacturing pin of crown pulley (DD. 6).	1	12 98	
69 Manufacturing Gun Metal Bush for crown pulley (DD.6).	2	82 24	
70 Manufacturing steel bush for crown pulley (DD.6).	1	5 50	
71 Manufacturing of pin for crown sleeve ..	1	11 00	
72 Manufacturing of heel sleeve bushes ..	2	93 98	
73 Manufacturing clutch link pins of D4. tractor.	16	28 14	
74 Manufacturing clutch links of D4.	16	33 47	
75 Manufacturing Gun Metal bush as per size (2½×1'×2'×1').	2	112 56	
76 Manufacturing pump shaft for well No. 50.	1	50 00	
77 Manufacturing bushing for pump	1	21 80	
78 Manufacturing nut for pump	1	10	

APPENDIX 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.	
(1)	(2)	(3)	
		RS. NP.	
79 Manufacturing Gun Metal Rods	2	127 82	
80 Manufacturing diesel tank for D4. tractor ..	6	20 72	
81 Manufacturing lock washer for sprocket wheel nut.	9	9 24	
82 Manufacturing sleeve for D7. 8078	2	21 78	
83 Manufacturing Jack shaft collar	1	10 22	
84 Manufacturing from clamps with bolts and nuts.	1	10 28	
85 Manufacturing one bolt and nut with washer.	1	5 86	
86 Manufacturing pump shaft as per sample ..	1	18 40	
87 Manufacturing pump for bush for pump shaft.	1	18 20	
88 Manufacturing bell post	1	33 28	
89 Manufacturing and supply bed bolts as per size.	10	133 21	
90 Manufacturing smith tongs	2	17 18	
91 Manufacturing and supply kjeldal stand for nitrogen examination.	1	86 20	
92 Manufacturing bolt for diagonal brace of D7. 7126.	1	8 78	
93 Manufacturing bushing	1	5 32	
94 Manufacturing shaft	1	10 80	
95 Manufacturing bushing for clutch yoke of D. 6.	1	6 12	
96 Manufacturing shaft for water pump of D. 6.	..	20 74	
97 Manufacturing pin for clutch levers	4	12 78	
98 Manufacturing lock for D4. roller collar ..	49	30 91	
99 Manufacturing lock for D 4. idler plates ..	12	30 85	
100 Manufacturing sleeve for D4. as per sample.	2	39 11	
101 Manufacturing bolt as per sample for D4 ..	4	20 98	
102 Manufacturing plate assembly for front idler DD. 4.	4	20 00	
103 Manufacturing pins as per sample for D4. compressor leaves.	5	10 20	
104 Manufacturing metal rod 6" long with threads.	1	8 11	
105 Manufacturing H. P. Valve studs as per size.	2	2 81	
106 Manufacturing crown sleeve pin for P.D. 9 drill.	..	7 89	
107 Manufacturing bed bolts (5/8"×1½")	..	18 28	
108 Manufacturing lock washer for fly wheel ..	4	10 45	
109 Manufacturing lock washer for clutch shaft.	1	4 08	
110 Manufacturing lock bolts and nuts for idler wheel adjustment.	3	21 70	
111 Manufacturing lock bolts and nuts for idler wheel adjustment of D. 4.	..	103 90	

APPENDIX 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP
112 Manufacturing guide assembly	12	136 1
113 Manufacturing washer valve spring ..	..	18 84
114 Manufacturing one two-way union as per sample.	1	16 07
115 Manufacturing radiator support as per sample.	2	17 08
116 Manufacturing collars as per size given ..	2	20 23
117 Manufacturing shackle bushes	4	30 72
118 Manufacturing 5/8" × 10" bolts with nuts having thread 2".	4	14 12
119 Manufacturing 5/8" × 6" bolts with nuts having thread for 1".	4	1 24
120 Manufacturing wooden handle 4" long as per specimen.	1	48
121 Manufacturing the bendix screw DD. 10 ..	1	11 74
122 Manufacturing bendix drive assembly collar.	1 set.	12 32
123 Manufacturing lock No. 6B. 8357	38	14 12
124 Manufacturing water pump studs as per sample.	2	5 30
125 Manufacturing 403 U clamp	1	32 64
126 Manufacturing D7. clutch links	15	450 56
127 Manufacturing of water pump bushes ..	1	8 96
128 Manufacturing pedal shaft	2 Nos.	5 92
129 Manufacturing clutch lever steering shaft ..	1 No.	27 22
130 Manufacturing steering lever shaft	1 "	10 70
131 Manufacturing lever bush	2 Nos.	9 72
132 Manufacturing brake pedal bush	2 "	50 80
133 Manufacturing one dye for clutch link belt cutting.	1 No.	17 60
134 Manufacturing of dynamo bush, self starter bush and fly wheel bush.	5 Nos.	22 48
135 Manufacturing of shackle bushes	4 "	25 46
136 Manufacturing 1/4" thick washers for hub bearing.	2 "	10 56
137 Manufacturing steering level centre shaft ..	1 No.	13 74
138 Manufacturing moulding box for oil engine ..	1 "	24 82
139 Manufacturing one lister oil engine pulley ..	1 "	67 66
140 Manufacturing one cutter stem for dorman engine.	1 "	3 72
141 Manufacturing steering clutch shaft key ..	2 Nos.	23 66
142 Manufacturing bushes steering lever ..	2 "	25 70
143 Manufacturing carrier roller sleeve for steering bracket.	4 "	36 29
144 Manufacturing steel sleeve for steering bracket.	1 No.	6 00

APPENDIX 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
145 Manufacturing 5-litre measuring cans ..	10 Nos.	226 90
146 Manufacturing starting pinion pin	2 "	2 62
147 Blacksmith tool box manufacturing	1 No.	118 80
148 Manufacturing shaft lever cover	2 Nos.	10 68
149 Do.	2 "	13 94
150 Manufacturing key for gear lever	2 "	17 92
151 Manufacturing dowels for diagonal brace bearings.	16 "	9 43
152 Manufacturing of D7. clutch links	11 "	85 15
153 Manufacturing of master pin collars	4 "	127 80
154 Manufacturing of blade H7. guntaka	6 "	100 57
155 Manufacturing of D4. plate assembly for front idler wheel.	1 No.	118 97
156 Manufacturing one litre cans	10 Nos.	122 51
157 Manufacturing D7. roller lock washers ..	115 "	36 64
158 One plant to be provided for feet to be fixed between truck and engine side.	1 No.	3 92
159 Manufacturing of clutch shaft and bushing ..	2 Nos.	19 10
160 Manufacturing wheel axle bolts as per sample.	16 "	17 86
161 Manufacturing zinc sheet lables (5" × 4") ..	30 Nos.	9 16
162 Lister oil engine pulley key	1 No.	5 36
163 Manufacturing bushing for D7. track rollers.	24 Nos.	32 55
164 Manufacturing bushing for D4. tractor ..	16 "	288 22
165 Manufacturing box spanner for wheel nut 1/2 × 1 1/4".	1 No.	103 44
166 Manufacturing collar screws as per sample ..	8 Nos.	6 32
167 Manufacturing share point for victory plough.	1 No.	120 36
168 Manufacturing a box with teak wood for the spectrometer.	1 "	170 74
169 Manufacturing 5-litre cans	24 Nos.	32 02
170 Manufacturing shock absorber iron plates ..	6 "	144 01
171 Manufacturing water jackets as per sample for condensers for distillation apparatus.	12 "	74 82
172 Manufacturing one bush for crank pin with gun metal for DD2.	1 No.	25 64
173 Manufacturing seal and starter bushes for lorry MSZ 2419.	2 Nos.	7 78
174 Manufacturing clutch links for D6. tractor ..	10 "	159 85
175 Providing 5/8" × 10" bolts and nuts	4 "	14 48
176 Manufacturing litre cans	10 "	137 57
177 Manufacturing of five litre can	1 No.	16 36
178 Manufacturing petrol cover for A.C. III ..	1 "	8 62
179 Providing foundation bolts and nuts 5/8" × 1 1/4"	4 Nos.	13 88

APPENDIX 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
180 Manufacturing clutch cover as per sample for J.D. MSZ 165.	1 No.	17 10
181 Manufacturing Jig for excentric	1 ..	15 88
182 Manufacturing of male and female door points.	4 pairs.	47 07
183 Manufacturing carrier roller sleeve for D7. 8078.	4 Nos.	11 95
184 Manufacturing union to connect the fuel gauge to cylinder block.	1 No.	1 57
185 Manufacturing of recoil spring bolt of D7. tractor.	6 Nos.	277 75
186 Manufacturing of cutters for T.D.6. tractor.	1 set.	28 22
187 Manufacturing of steering drum yoke bolts.	2 Nos.	17 79
188 Manufacturing of seal and starter bushes ..	2 ..	1 80
189 Lables 4" x 3" x 2'.	200 ..	123 00
190 Manufacturing clutch pedal bush for massey harris.	1 No.	1 75
191 Manufacturing of king pin bushes for massey harris tractor.	4 Nos.	17 18
192 Manufacturing lables 12" x 10" x 3' ..	20 ..	23 00
193 Jack hammer side bolt and nuts as per sample.	4 ..	21 51
194 Manufacturing of G.M. rods	4 ..	17 00
195 Manufacturing of D7. clutch links	11 ..	213 81
196 Manufacturing carpenter's chisel 6" broad ..	1 No.	27 08
197 Manufacturing carpenters chisel 3" broad ..	1 ..	6 59
198 Manufacturing sprocket nut lock	6 Nos.	15 40
199 Manufacturing wooden handle for sledge hammer.	4 ..	13 44
200 Manufacturing pump shaft as per sample ..	1 No.	20 52
201 Manufacturing grease cup cover	1 ..	9 22
202 Manufacturing air valve cock for pump ..	1 ..	3 00
203 Manufacturing cast iron rods	8 Nos.	10 00
204 Manufacturing of radiator out let belt MD 44978.	1 No.	3 08
205 Manufacturing D7. sprocket hub nut lock washers.	6 Nos.	19 43
206 Manufacturing of cutter sharpening mandrills.	2 ..	13 00
207 Manufacturing of self starter bush lorry MSC 9551.	1 No.	3 00
208 Manufacturing jack hammer rod retainer set for R.B.U. II.	1 ..	38 66
209 Manufacturing of lock washers	36 Nos.	21 87
210 Manufacturing of G.M. solid rods	3 ..	13 00
211 Manufacturing drum shaft	2 ..	231 88

APPENDIX 21—cont.

List of spare parts manufactured in the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
212 Manufacturing hydraulic bushing	..	100 25
213 Manufacturing share points	..	245 50
214 Manufacturing of master pin lock collar ..	4 Nos.	17 38
215 Manufacturing track master pin	12 ..	75 06
216 Manufacturing 4" coir filter point	6 ..	245 31
217 Manufacturing D7. roller bushings	4 ..	73 46
218 Manufacturing D7. idler wheel bushings ..	4 ..	78 60
219 Manufacturing D7. carrier roller sleeve ..	3 ..	20 79
220 Manufacturing D7. bushings	4 ..	75 00
221 Manufacturing collar idler plates MD 7. ..	20 ..	50 00
222 Manufacturing chasis support wooden block.	1 No.	20 26
223 Derick seating support lock provided for D.D. 6.	1 ..	105 70
224 Manufacturing half litre can	10 Nos.	107 54
225 Manufacturing mandrill for D.D. 17. ..	1 No.	24 25
226 Manufacturing 'U' clamp for victory plough as per sample.	12 Nos.	68 55
227 Manufacturing clutch link	5 ..	91 41
228 Manufacturing fly wheel pin	5 ..	24 52
229 Manufacturing lock	5 ..	4 48
230 Manufacturing lock	5 ..	4 48
231 Manufacturing side bolts and nuts for jack hammer.	2 ..	11 62
232 Manufacturing clutch brake disc of D4 ..	24 ..	25 00
233 Manufacturing track master link collar ..	4 ..	14 72
234 Manufacturing feed hoppers	24 ..	150 00
235 Manufacturing hood for D7-7126	1 No.	170 00
236 Manufacturing 1/2 litre cans	9 Nos.	70 00
237 Share point for killifer plough	4 ..	100 00
238 Manufacturing bushing for steering rod ..	4 ..	31 27
239 Manufacturing hydraulic pump bushing for D4. tractor.	..	90 00
240 Manufacturing one litre can	9 Nos.	75 00
241 Track master pin collar for D7	20 ..	24 54
242 Manufacturing yoke shaft	1 No.	6 32
243 Manufacturing clutch cover bushing for D7.	2 Nos.	8 62
244 Measuring can 5 litres manufacturing ..	9 ..	204 06
245 Manufacturing D4. guide	8 ..	88 88
246 Manufacturing of D4. clutch links	24 ..	54 08
247 Manufacturing D4. main engine valve cutter sleeve.	1 No.	5 89
248 Manufacturing D4. starting engine valve sleeve.	1 ..	5 89
249 Manufacturing of funnel 9" size for D4. 4978	1 ..	12 47

APPENDIX 21—cont.

List of spare parts manufactured in the Tractor Workshop, Coimbatore for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. RP.
250 Manufacturing of 8" pipe and 5" thick clamp	1 No.	53 00
251 Manufacturing D4. hydraulic pump bushing.	8 Nos.	175 91
252 Manufacturing twenty litre cans	10 "	310 40
253 Manufacturing of share points	12 "	320 00
254 Manufacturing petrol engine valve cutters	2 "	28 27
255 Manufacturing 1/2" box spanner	6 "	42 28
256 Manufacturing 15/16" box spanner	6 "	64 31
257 Manufacturing clutch links	27 "	427 42
258 Manufacturing exhaust muffler for D7-7128.	1 No.	68 00
259 Manufacturing brake pedal shaft bushing ..	2 Nos.	40 48
260 Manufacturing carrier roller sleeve	4 "	38 82
261 Manufacturing master pin collar D7. 8078 ..	2 "	6 00
262 Manufacturing feed hoppers	24 "	171 46
263 Manufacturing mandrill as per sample ..	1 No.	17 50
264 Manufacturing track roller plates	20 Nos.	101 08
265 Manufacturing clutch links	25 "	415 00
266 Manufacturing shaft	1 No.	9 94
267 Manufacturing of pedal bushes	2 Nos.	40 17
268 Manufacturing one pump shaft	1 No.	20 88
269 Manufacturing one gun metal bush	1 "	23 84
270 Manufacturing one shaft for the pump in well No. 40.	1 "	5 67
271 Manufacturing one gun metal bush for the shaft.	1 "	33 50
272 Manufacturing of lock	4 Nos.	3 00
273 Manufacturing of steering lever bushing ..	2 "	2 75
274 Manufacturing valve operating lever for R. B. U. III.	1 No.	24 31
275 Manufacturing of master pin collar	..	27 76
276 Manufacturing lock	4 Nos.	10 00
277 Manufacturing bushing	2 "	20 44
278 Manufacturing brake pedal bushing	2 "	37 26
279 Manufacturing clutch assembly shaft	1 No.	16 57
280 Manufacturing shaft	1 "	6 52
281 Manufacturing bushing	4 Nos.	23 82
282 Manufacturing steel bushing	2 "	5 83
283 Manufacturing of brass bushing	2 "	14 74
284 Manufacturing of internal gear wheel ..	1 No.	45 00
285 Making pattern for 5 R crankshaft pulley.	1 "	165 00
286 Manufacturing shaft	2 Nos.	7 34
287 Manufacturing drinking water tank cart ..	1 No.	300 00
288 Manufacturing C. H. collars for pump of A. V. 2. peter oil engine.	3 Nos.	36 74

APPENDIX 21—cont.

List of spare parts manufactured in the Tractor Workshop, Coimbatore for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. RP.
289 Manufacturing of small and bush for A.V. 2. peter oil engine.	1 No.	14 14
290 Manufacturing wire of union for water filling funnel for pump.	1 "	3 4
291 Manufacturing pedal bushing	2 Nos.	30 36
292 Manufacturing pedal shaft	2 "	6 30
293 Manufacturing hydraulic pump bushing ..	8 "	172 33
294 Manufacturing clutch shaft for D4	8 "	95 24
295 Manufacturing starting engine fly wheel nut	8 "	38 22
296 Manufacturing crossley oil engine sleeve ..	2 "	100 53
297 Manufacturing of clutch link pin	24 "	24 68
298 Manufacturing track master pin collar ..	8 "	6 62
299 Manufacturing steering shaft	1 No.	8 35
300 Air cleaner assembly manufacturing	1 "	106 00
301 Manufacturing 5/1" x 2" studs	..	3 14
302 Manufacturing bushes	4 Nos.	25 82
303 Manufacturing bushing steel	2 "	8 54
304 Manufacturing shaft	1 No.	20 62
305 Manufacturing of steel bushes	2 Nos.	8 54
306 Manufacturing Key for pump pulley	1 No.	2 57
307 Manufacturing of lables (2 1/2 x 3 1/2)	300 Nos.	106 00
308 Manufacturing lubricant oil union for R. N. oil engine.	1 No.	5 50
309 D7 starting engine valve cutter manu- facturing.	1 "	24 00
310 Manufacturing keen rozkonskin boxes ..	12 Nos.	47 88
311 Manufacturing D7. starting engine valve cutter.	1 No.	47 00
312 Manufacturing valve cutter stain	1 "	6 24
313 Manufacturing black board with stand ..	1 "	85 00
314 Manufacturing equalizer spring bolt for D7.	2 Nos.	24 80
315 Manufacturing earth grader	1 No.	50 52
316 Manufacturing of air lock spanner	1 "	9 20
317 Manufacturing of 20 litre cans	7 Nos.	88 00
318 Manufacturing fly wheel lock nut for John Deere tractor MDC 7879.	1 No.	13 02
319 Manufacturing carrier roller shaft sleeve ..	15 Nos.	76 44
320 Manufacturing recoil spring bolt	4 "	240 54
321 Manufacturing clutch centre for drill ..	3 "	304 92
322 Manufacturing foundation bolt and nut ..	8 "	11 20
323 Manufacturing earth grader	1 "	40 00
324 Manufacturing stencil plate in zinc sheet ..	1 "	36 84
325 Manufacturing tin cutter	1 "	14 76
326 Manufacturing bushing	4 "	26 73

APPENDIX 21—cont.

List of spare parts manufactured at the Tractor Workshop, Coimbatore, for the period from 1st July 1960 to 30th June 1961—cont.

Serial number and particular. (1)	Quantity. (2)	Amount, (3) RS. NP.
327 Moulding 1½" gun metal rods	35	13 81
328 Moulding the gunmetal rods	24 K. G.	90 00
329 Manufacturing of crow bar	2	42 36
330 Manufacturing of bushing steel	2	8 54
331 Manufacturing roller plate	20	112 82
332 Manufacturing pedal shaft	2	6 60
333 Manufacturing of lock washer	40	19 34
334 Manufacturing of pump shaft for oil engine.	1	3 37
335 Manufacturing idler wheel collar pin ..	4	20 52
336 Manufacturing pump and bush	1	40 46
337 Manufacturing starting engine clutch sleeve.	4	20 28
338 Manufacturing clutch links for D7	20	464 92
339 Manufacturing crankshaft plate washer ..	2	2 12
340 Manufacturing pedal gun metal bushing ..	2	42 02
341 Manufacturing of water pump shaft	2	27 70
342 Manufacturing of attachment for sharpening of wood planing machine blade.	1 set.	30 00
343 Manufacturing idler wheel collar pin ..	4	13 20
344 Manufacturing clutch link pin	12	14 00
345 Manufacturing 12" pipe wrench end link for D.D.7.	2	34 94
346 Manufacturing 1/16" valve spring washers ..	12	13 00
347 Manufacturing 1/8" valve spring washers ..	12	13 00
348 Manufacturing of bushing for steering assembly.	4 Nos.	6 14
349 Manufacturing 5 R series crankshaft pulley	3	220 00
350 Manufacturing G. M. track roller bushing ..	12	333 67
351 Manufacturing ten litre cans	7	134 90
352 Manufacturing five litre cans	7	146 62
353 Manufacturing two litre cans	7	92 76
354 Manufacturing litre cane (one)	7	66 74
355 Manufacturing victory plough shares ..	24	94 94
Total ..		20,904 46

APPENDIX 22.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore.

Serial number and particulars. (1)	Quantity. (2)	Amount (3) RS. NP.
1 Reconditioning the F.F. roller shaft and grease nipple of D6.	4 Nos.	53 00
2 Reconditioning the S.F. Track roller with shaft and grease nipple of D6.	4 ..	55 44
3 Reconditioning the clutch lever bush and shaft of D6.	1 No.	12 33
4 Fitting and redrilling the pin in the fly wheel clutch control of D6.	3 Nos.	49 51
5 Clutch cover bottom bush to suit the new shaft of D6.	1 No.	5 76
6 Repairing the clutch housing bottom shaft lever of D6.	1 ..	82 62
7 Soldering and repairing the avery platform balance.	1 ..	80 18
8 Repairing the oil filter oil engine	1 ..	12 56
9 Repairing welding the pump pulley	1 ..	24 72
10 Reconditioning and welding TD14. corner blades.	2 Nos.	39 24
11 Reconditioning and welding T6 track grouser plates.	23 Nos.	101 42
12 Reconditioning and welding the broken axle arm of cobey wagon.	1 No.	4 86
13 Repairing the radiator of MSZ 2419	1 ..	8 44
14 Welding the leaky barrels	15 Nos.	6 98
15 Valve seat insert and grinding valves of D4. cylinder head.	1 No.	25 70
16 Spring leaf welding and fitting to single bullock cart and painting.	1 ..	81 22
17 Repairs to water pump pulley of DD17. drill.	1 ..	20 16
18 Repairing and servicing the shotting attachment of milling machine.	1 ..	13 87
19 Reconditioning and welding the sprocket wheel of D7. 7126.	1 ..	165 64
20 Repairing the flanges coupling to hobert welding set and completing refitting.	1 ..	450 16
21 Drilling holes to draw bar of 5 disc plough to ½" size.	2 Nos.	17 92
22 Reconditioning the front idler wheel of D7. 8078.	1 No.	59 90
23 Reconditioning the front idler shaft of D7. 8078.	1 ..	44 85
24 Welding the broken piece in the hydraulic press and reconditioning.	1 ..	26 14
25 Sraightening the angle iron post of fencing around rest house.	14 Nos.	14 41
26 Reconditioning the guide of D7. 8926	2 ..	12 22
27 Soldering the radiator and body welding for lorry MSC. 9547.	1 No.	21 96

APPENDIX 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
28 Cut and welding the spinal pipe in 6" pipe and S.W.I. pipe.	1 "	62 66
29 Straightening and drilling holes in 4 disc J.D. plough draw bar attachment.	2 Nos.	19 32
30 Repairing the chair cum desks	20 "	219 26
31 Repairing the towing bar of DD9. Drill ..	1 No.	18 80
32 Repairing the radiator of DD17. drill and soldering fuel line.	1 "	139 76
33 Welding the cracked portion in the drill of separator of DD17. drill.	1 "	11 68
34 Rethread and fitting the foundation bolt of ginning machine.	1 "	5 38
35 Repairs to the jars and welding	2 Nos.	41 32
36 Repairing the butter chums.. ..	4 "	33 43
37 Repairing the saddle of the stanley lathe and replacing the clutch cut and screw rod bearing.	4 "	152 92
38 Reconditioning the carrier roller bushes and shaft.	4 "	13 44
39 Reconditioning the front idler collar of D7. 7128.	2 "	61 54
40 Providing a place and welding the channel of heel sleeve of drill DD16.	1 "	43 02
41 Welding the cracked portion in spudding arm side of drill DD10.	1 "	8 32
42 Reconditioning the carrier roller of D7. 6298.	4 Nos.	24 04
43 Reconditioning the carrier roller shaft of rethreading of D7. 6298.	4 "	63 04
44 Reconditioning the front sleeve pulley ..	1 No.	5 42
45 Reconditioning the master pin of D7. 6298.	2 Nos.	6 59
46 Sharpening the pruning sheers	3 "	4 54
47 Reconditioning the sleeve for latch with pack pin of D7. 3926.	2 "	12 47
48 Reconditioning the master pin of D7. 7952.	1 No.	7 28
49 Reconditioning the master pin collars of D7. 7052.	2 Nos.	2 08
50 Reconditioning the track chain by bush and link welding of 7126.	1 No.	321 16
51 Reconditioning and removing the broken stud from track frame of D7. 3926.	1 "	4 48
52 Reconditioning the idler collar of D7. 8078.	2 Nos.	25 56
53 Reconditioning the collar plate of D7. 7126.	2 "	5 55
54 Reconditioning the pinion half bearing of D7. 7126.	2 "	7 84

APPENDIX 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)
55 Soldering the plough wire of Van MDC 1103.	3 Nos.	5 44
56 Repairing the single desk	1 No.	26 02
57 Removing the segments and rivetting to clutch bearing.	7 Nos.	15 28
58 Reconditioning the radiator of jeep MSZ 5038.	1 No.	9 48
59 Providing support in rear of jeep MSZ 5048 both stephey.	1 "	5 82
60 Cutting the 6" BSVI Pipe 11'—5" as spiral pipe.	1 "	19 14
61 Forge welding of ends of 10' M.H. rods ..	10 Nos.	132 62
62 Reconditioning the clutch blade of D7. 8078.	1 No.	182 22
63 Reconditioning the jar of drill No. DD7.	1 No.	13 32
64 Providing clamp for rear spring of lorry MSC 9612.	1 "	12 20
65 Reconditioning the pulley back of D7. 5822.	1 "	9 88
66 Welding the pipe together	1 "	12 74
67 Welding the water tank at leak portion ..	2 Nos.	14 46
68 Repairing the law mover	1 No.	8 96
69 Sharpening the pruning sheers	1 "	2 48
70 Reconditioning the pulley block of D7. 5822.	1 "	7 34
71 Removed the bowel and bends of the slip socket.	2 Nos.	25 64
72 Repairing the leaky water bath	1 No.	20 28
73 Reconditioning the exhaust muffler and starting handle of oil engine.	2 Nos.	5 18
74 Reconditioning the governor rod yoke pin of oil engine.	2 "	2 39
75 Reconditioning the corner blade of D7. 4180.	2 "	36 10
76 Soldering the radiator and pipe of Van MD01103.	1 No.	19 74
77 Setting the teeth of collar saw for cutting wood.	2 Nos.	15 44
78 Clean the petrol tank and soldering the pipe of lorry MSZ 2419.	1 No.	17 04
79 Welding the drilling bar (2½ x ½) of DD7. drill.	1 "	12 54
80 Reconditioning the crown foot of fishing tool MB70.	1 "	8 48
81 Welding the valve clamp for DD3 ..	2 Nos.	15 26
82 Repairing the batner dusters by rivetting and making hole in the disc plate.	5 "	28 19
83 Reconditioning the carrier roller shaft dust plate of D7.	4 "	13 44

APPENDIX 21—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		Rs. & P.
84 Reconditioning the radiator of D7/5822 ..	1 No.	8 96
85 6" slip socket: To remove welded piece sand to face the end.	1 "	18 84
86 Rivetting the P.C.U. lining for D7. 5822 ..	1 "	4 5
87 Reconditioning the key ways of the impeller of well No. 40.	1 "	10 22
88 Reconditioning the radiator cap of D7. 3926.	1 "	8 36
89 Welding the 32 disc harrow U clamp ..	1 "	8 60
90 Reconditioning the coupling pulleys of well No. 40.	2 Nos.	10 72
91 Cleaning the radiator and rectifying the leakage of van MDO 1103.	1 No.	4 80
92 Remove the bend in bumper of van MDO 1103.	1 "	11 01
93 Welding and turning the roller collar plate of D7. 6298.	4 Nos.	14 92
94 Reconditioning the key and key way of dynamo of jeep MDC 8350.	1 No.	2 24
95 Reconditioning the front idler wheel of D7.	1 "	98 80
96 Reconditioning the idler shaft of D7.	1 "	45 36
97 Reconditioning and welding the trolley of oil engine	1 "	5 78
98 Cleaning and welding the bell bore around and pipe of H.P. 70.	1 "	34 94
99 Bush to be provided for spudding sleeve of C.F.D.I.	1 "	69 20
100 Straightening the spudding shaft of C.P.D.I.	1 "	13 28
101 Reconditioning the exhaust pipe of D7. 3872.	1 "	20 90
102 Welding the jar of DD7. and extension.	2 Nos.	16 40
103 Reconditioning the pulley of water pump in well No. 50.	1 No.	2 39
104 Reconditioning the pump of well No. 50.	1 "	4 48
105 Welding the chesis of D7. by providing 3 pieces.	1 "	113 66
106 Reconditioning the radiator cap of 2K. M.D.C. 4517.	1 "	6 42
107 Reconditioning the carrier roller plate of D7.	4 Nos.	35 36
108 Repairing the S.S. Pulley	1 No.	8 74
109 Refacing the valves of D7.	8 Nos.	11 48
110 Reconditioning the street plate of D7.	2 "	15 78
111 Welding the sparature of the duster plates.	20 "	18 92
112 Reconditioning the sprocket wheel of D7. 2491.	2 "	182 76

APPENDIX No. 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and description.	Quantity.	Amount.
(1)	(2)	(3)
		Rs. & P.
113 Setting the teeth of circular saw	1	11 58
114 Reconditioning the clutch and brake shaft to suit the bush.	1	14 26
115 Reconditioning the clutch release bearing sleeve of jeep 8350.	1	11 38
116 Providing groove at piston of C.E. 141043.	1	4 48
117 Repairing the check fan screw	1	19 98
118 Reconditioning the bushes of the clutch and brake pedal and rod of jeep 8350.	2	13 38
119 Providing pin for flat valve boiler of DD7.	1	25 56
120 Reconditioning the master pin collar of D7.	4	9 00
121 Reconditioning the carrier roller of D7.	1	14 62
122 Reconditioning the idler wheel of D7.	2	158 56
123 Grinding the 20K. M. H. crankshaft ..	2	56 21
124 Repairing the leakage portion of D.W. still and replacing pipes.	1	.. ..
125 Turn and cut grooves to the piston to suit rings.	2	5 50
126 Providing plate for liner puller	1	8 96
127 Soldering the radiator of D7	1	129 96
128 Sharpening the pruning shears	6	2 21
129 Reconditioning the cover of the pump sprayer.	1	9 27
130 Remetalling the connecting rods of J.D. tractor.	2	106 44
131 Reconditioning the collar pin of clutch of D7.	1	5 50
132 Polishing the crankshaft of J.D. Tractor 5870.	1	18 06
133 Reconditioning the radiator of J.D. tractor.	1	4 48
134 Reconditioning the bell crank pin of U. frame.	1	11 18
135 Reconditioning the idler wheel of D4. ..	1	38 74
136 Reconditioning the bell crank of D4. ..	2	12 42
137 Reconditioning the bell links of D4. ..	2	27 24
138 Repairing the electrical water bath ..	1	33 96
139 Providing planks to bush vice at the garage fitting.	1	150 24
140 Cutting and supply of zinc labels	2	15 27
141 Reconditioning the corner blade of D7 ..	2	50 80
142 Welding the jar 2½" for DD7. drill ..	1	12 19
143 Forge welding of 10" N.P. rods	10	145 07
144 Welding the back mudguard of lorry MSC. 9541.	.. ..	19 00
145 Reconditioning the carrier rollers of D7. 2491.	.. ..	31 00
146 Cutting the old bolts from the chain of D7.	15	8 96

APPENDIX 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and description. (1)	Quantity. (2)	Amount (3) Rs. NP.
147 Reconditioning the cylinder grating of hot water boiler and repairs.	1	4 48
148 Cabin welding of lorry MSZ 2419	1	11 08
149 Reconditioning the bolts for bush vice ..	3	8 79
150 Reconditioning the 'A' frame of D7 and master pin.	2	53 04
151 Providing structure for the front side curtain of jeep MDC 8350.	..	23 32
152 Removing broken lock and drill hole in water pump of jeep MDC 8350.	.	8 16
153 Reconditioning and welding the check wrench gripe.	1	8 96
154 Reboring the broken studs in roller frame of D4.	1	20 04
155 Welding the side arm of D4	1	51 92
156 Welding the bell crank of D4	1	20 08
157 Providing and stitching hood cloth of D7 ..	1	10 00
158 Reconditioning the fibre washer for fuel filter of D7 3928.	1	9 26
159 Reconditioning the over flow pipe washer of fuel line of D7.	10	4 8
160 Reconditioning the front idler wheel of D7.	1	34 32
161 Reconditioning the keys and key ways of pump shaft and pulley of well No.77.	5	12 44
162 Patch up work in jeep MSZ 4203.	1	15 54
163 Reconditioning the front idler wheel of D7.	1	56 96
164 Reconditioning the tail light of jeep 8350 ..	1	6 36
165 Alter the battery bracket to suit the new battery.	1	6 36
166 Reposition the stepney wheel bracket to jeep.	1	6 36
167 Attended the minor reconditioned works in body.	1	26 79
168 Refacing the valves of lister of S.H.P.O.E...	2	4 70
169 Reconditioning the drain plug of the sprayer.	1	3 79
170 Soldering the fuel tube O.V.O.E. 3516 ..	1	3 18
171 Reconditioning the master pin with collar ..	2	19 85
172 Welding the track link of D7.	2	28 82
173 Repair and welding the folding iron chair ..	13	14 36
174 Reconditioning the brake adjusting bolt and nut of D7.	2	20 82
175 Reconditioning the idler wheel collar of D7.	2	56 33
176 Turn and cut groove in the piston of lister of H.P.O.E. 10144	1	5 50
177 Reconditioning the corner blade of D7. 3926.	1	20 66
178 Reconditioning the gate valve of well No. 77.	1	21 17
179 Reconditioning the plough eye bolt plough 504 M.H. plough.	1	2 47

APPENDIX 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and description. (1)	Quantity. (2)	Amount (3) Rs. NP.
180 Cutting the track bush of D7. 6298 ..	1	2 47
181 Reconditioning the corner blades of D4. ..	12	72 84
182 Reconditioning the corner blades of D7. ..	2	76 00
183 Reconditioning and fixing the number plate.	1	14 00
184 Reconditioning the fuel filter housing ..	1	16 06
185 Reconditioning the frame of the aluminium tiffin carrier.	1	4 48
186 Reconditioning the silencer of jeep 8350 ..	1	2 47
187 Reconditioning the air cleaner of D4. ..	1	13 00
188 Reconditioning the carrier roller shaft of D7.	2	43 81
189 Reconditioning the master pin and collers of D7.	6	52 37
190 Reconditioning the silencer clamp of jeep 4203.	2	13 90
191 Repairs to chairs and record racks	4	64 20
192 Reconditioning the fuel steel drum	1	31 30
193 Removing broken studs from radiator and fitted new stud.	1	8 96
194 Reconditioning the broken handle of the fuel seal.	1	6 48
195 Reconditioning the plough disc cutting the centre blade hole to suit harrow.	9	12 90
196 Provide threads for 3" dia G.I. pipe (Cutting the pipe into ten equal sizes.)	1	5 50
197 Block one end of coupling pipe	1	1 60
198 Providing nuts for oil engine	2	4 48
199 Reconditioning the corner blades of D7. ..	2	..
200 Reconditioning the clutch collar and removing broken stud from the collar of D7. 4180.	1	2 31
201 Reconditioning the clutch shaft gear ..	1	38 13
202 Welding the cracked portion of lifting dogs and gorge welding to rings.	10	39 64
203 Reconditioning the spudding sleeve pin for TD. 6.	1	1 38
204 Reconditioning and welding the clutch fingers.	3	18 54
205 Reconditioning the bell crank of D4. /	2	31 64
206 Reconditioning the link of bell crank of D4.	2	24 88
207 Reconditioning the clutch engaging rod ..	1	6 36
208 Rivetting the brake lining of fuel seal ..	2	360 49
209 Rivetting the brake lining of sand seal ..	1	89 62
210 Provide an adopter to the cover of the fuel bound glass.	1	8 16
211 Reconditioning the wand reel drum support bracket.	1	63 92

APPENDIX 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and description.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
212 Providing G.M. Bush for the dynamo of jeep MDC 7879.	1	5 43
213 Reconditioning the track roller single flange of TD. 9.	3	38 86
214 Reconditioning the track roller double flange.	3	21 58
215 Reconditioning the idler wheel of TD. 9 ..	1	41 56
216 Reconditioning the idler wheel of D. 6 ..	1	60 56
217 Reconditioning the centre blade of D6 ..	3	358 38
218 Reconditioning the centre blade of D6 ..	1	74 00
219 Reconditioning the corner blades of D6 ..	7	73 14
220 Reconditioning the corner blades (ISH) of D6.	7	76 69
221 Reconditioning the track roller (D.F.) of D. 6.	3	44 00
222 Reconditioning the track roller (S.F.) of D. 6.	3	47 54
223 Reposition the lights in the front portion of the engine and patch work to body and mudguard for W6. MDC 6775.	..	75 51
224 Removing brass bushes and replacing new bushes for roller bush of D4.	16	19 82
225 Repairs to Cream separator	1	15 91
226 Reconditioning the piston rod of sprayer ..	1	3 16
227 Reconditioning the grouser plates of D6 ..	11	84 24
228 Reconditioning the centre pipe line of the inner side tube of sprayer.	1	19 63
229 Drilling holes in 4" flanges for fixing 5/8" bolts.	16	8 67
230 Reconditioning the sprocket wheel of D6 ..	2	146 68
231 Welding the link of the shock absorber of Van MSY 3808.	2	2 24
232 Build up the hexagonal heads of the bolts ..	6	7 49
233 Modifying the bed of electric motor to suit the pump set.	1	52 47
234 Providing bush and nut for the water pump circulator of PD. 9.	1	10 68
235 Cutting the track bolts of D7	20	9 28
236 Repairing the lock and key	1	1 00
237 Welding the leaky barrels	5	2 36
238 Reconditioning the carrier roller bed of D7. of fitting the hood at workshop.	..	70 28
239 Repairing and welding the mudguard and silencer of lorry 9626.	..	16 50
240 Repairing the broken left shaft	1	33 03
241 Repairing the broken main shaft	1	46 67

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and description.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
242 Repairing and welding the ridge ploughs ..	3	29 52
243 Providing handles for victory plough and repairs.	2	43 86
244 Reconditioning the grouser plates of D6 ..	28	163 00
245 Repairing the chairs and tables	4	94 74
246 Rethreading of 6" heavy chisels	6	36 46
247 Reconditioning the clutch yoke of D6 ..	2	26 36
248 Reconditioning the radiator and welding the rear shaft of jeep MDC 8501.	1	21 90
249 Reconditioning the carrier roller of D6 ..	1	21 74
250 Soldering the lids of Tree killer	40	6 58
251 Reconditioning the radiator of D7. 3894 ..	1	38 92
252 Reconditioning the sprocket nut of D7. 3894.	1	14 67
253 Reconditioning the water pump nut of D7. 3894.	1	11 00
254 Reconditioning the wooden tool box	1	..
255 Reconditioning the idler wheel of D6	1	57 83
256 Removing the shaft from impeller of the water pump of D7.	1	4 48
257 Removing the broken studs front cylinder head of D7.	2	4 48
258 Providing and reconditioning the driver hood of D7. 3872.	1	118 42
259 Providing and studs to rear wheel drums for lorry 9551.	16	20 15
260 Removing the broken allen screw from clutch crank of the frame shaft.	1	6 64
261 Removing the broken stud from rear wheel drum of lorry MSC 9551.	16	14 94
262 Reconditioning the corner blades	2	49 32
263 Reconditioning the carrier roller of D7 3894.	1	4 10
264 Welding the rear sleeve bracket for DD6 ..	1	3 35
265 Welding the 'U' frame of D7. 7052	1	43 06
266 Repairing valve of D7. 3894	9	2 39
267 Welding the trunion bearing ball and shovel removing the broken bolts from rope pulley at Ammappatti.	2	146 18
268 Welding the idler wheel of D7. 3894	1	37 62
269 Reconditioning the master pin of D7. 3872.	2	8 26
270 Reconditioning the clutch fingers of DD6 ..	3	10 94
271 Providing carrier roller collar	2	13 60
272 Reconditioning the master pin collar of D7. 3894.	4	2 75
273 Reconditioning the P.C.U. Pulley cover of D7. 3872.	2	73 03

APPENDIX No. 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and description.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
274 Providing studs for jeep MDC 5879 ..	4	40 27
275 Providing clutch pins and replacing clutch rollers.	3	31 72
276 Welding the cracked portion of steering bracket.	1	37 30
277 Reconditioning the gate valve	1	15 80
278 Sharpening the chaff cutter blades	2	6 36
279 Reconditioning and welding the track chain pins of D7.	..	23 96
280 Drilling holes in idler wheel bushes ..	2	1 59
281 Repairing the silencer of John Deere tractor.	1	25 55
282 Repairing the band push cart	1	33 91
283 Reconditioning the plough chains	6	15 20
284 Repairing and providing three way swan neck tape and single way swan neck tape of laboratory.	6	27 84
285 Repairing the engine cover of D7. 3872 ..	1	31 08
286 Soldering the radiator of jeep MSZ 4203 ..	1	17 94
287 Providing stephney plate for bracket and repairing bracket.	4	12 74
288 Remove worn out run in old D4. sprocket wheel and rewelding new rim.	3	97 81
289 Reconditioning the side arms of D4 ..	2	13 10
290 Welding the D.F. track rollers of D4 ..	4	35 82
291 Reconditioning the bell crank links of D4 ..	2	31 60
292 Repairing the gate of Possaripalayam ..	1	35 00
293 Removing and fixing and wiring in the switches of the workshop.	..	49 75
294 Reconditioning the cushion seat of D7. 3872.	2	39 46
295 Reconditioning and welding the pump bed lister engine (13.5 H.P.)	1	38 58
296 Soldering the fuel tank (RBV)	1	13 04
297 Repairing and welding the cracked portion of water carts.	1	81 34
298 Cutting the zinc sheet into small size pieces.	1,115	96 38
299 Reconditioning the tee bar R.B.V.V. ..	1	17 38
300 Providing bush for dynamo	1	5 49
301 Reconditioning the carrier roller of D7. 3926.	2	65 86
302 Grinding the D4. crank shaft to 050" U/S. connecting rod.	1	40 44
303 Providing the water link of D7. 3894 ..	..	..

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
304 Open bullock cart providing holes in the Centre beam checking of the wheel bearing and axle and providing angle iron for the drivers seat.	1	60 75
305 Reconditioning the stop cock of compressor.	1	8 75
306 Welding the track rollers	8	132 45
307 Reconditioning the radiator of D4	2	218 88
308 Welding the centre blades of D7	1	198 32
309 Removing the broken studs from chassis of D4. 3484.	1	15 10
310 Reconditioning the hose pipe of D7. 3872 ..	1	4 48
311 Reconditioning the spudding crankshaft ..	1	11 00
312 Welding the corner blades of D7. 7126 ..	2	32 36
313 Providing plug roll of D7. 3872	..	7 96
314 Reconditioning the providing foot board of John Deere MSZ 165.	2	175 68
315 Welding the hydraulic pump lever of John Deere MSZ 165.	1	11 02
316 Reconditioning the pins of crank arm DD 6.	2	5 50
317 Repairing the stellan	1	6 32
318 Reconditioning and welding the gland flange of well No. 50.	1	6 32
319 Welding the idler wheel of D7. 3872 ..	1	8 21
320 Rivetting brake lining to D7. brake band of D7. 7121.	1	8 96
321 Rivetting the P.C.U. lining for D7. 7052 ..	1	6 32
322 Welding the leaky barrels	10	14 62
323 Welding the pump body	1	81 02
324 Removing broken studs from water pump body of D4.	1	4 48
325 Reconditioning the welding main clutch yoke of D7. 7052.	1	10 34
326 Welding the cracked portion of case ..	1	105 61
327 Reconditioning and welding the links and pins.	1	221 13
328 Reconditioning the forged welding of hand bearing rods.	10	134 95
329 Grinding the D4. crankshaft of 030" under size.	1	46 48
330 Cutting field labels as per size 1½" x 1½" ..	10	7 70
331 Providing washers for bull gear pinion of D7. sprocket side.	2	8 96
332 Welding the idler shoe of D4.	2	67 80
333 Reconditioning to pump pulley	1	21 01
343 Welding the carrier roller of D4.	2	8 94

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
335 Providing the lock washers D7. 8078 ..	12	21 64
336 Welding the D.F. rollers of D4	4	34 82
337 Reconditioning the side arm links of D4. 3873.	2	30 02
338 Reconditioning and welding the water pipe of D7. 3893.	2	6 53
339 Welding the roller assembly pins for P.C.U. 7126.	3	4 86
340 Welding the cracked portion of track link at the front side wheel of lorry 9612.	1	11 30
341 Rethreading the stud of John Deere M.D.C. 5879.	1	4 32
342 Soldering the radiator of jeep MSZ 5048 ..	1	15 36
343 Welding the sprocket wheel of 7. 7052 ..	1	82 18
344 Grinding the D4. crankshaft	..	67 51
345 Repairing and welding the silencer of jeep MDC 9594.	1	9 48
346 Welding the sprocket wheel of D4. 4978 ..	1	83 53
347 Servicing the radiator of R.B.U./V. ..	1	41 41
348 Refacing the fuel transfer pump body and cover of D7. 7052.	1 set.	2 39
349 Reconditioning and fixing iron sprocket for the wheel.	2	69 96
350 Soldering fuel line of R.N. oil engine ..	1	4 96
351 Repairing and soldering the steam oven ..	1	27 43
352 Removing the 3" back clamps	4	15 34
353 Providing the key for pump pulley	1	8 96
354 Repairing the robert welding set	1	38 43
355 Welding the leaky barrels	5	5 24
356 Grinding the T. 6. crankshaft	1	40 59
357 Welding the in dot handle and providing key of Jack hammer.	2	9 94
358 Welding the rear seat of jeep MDJ 2209 ..	1	25 95
359 Reducing the nuts of D4. 4978	10	3 15
360 Removing studs from manifold and providing studs for jeep 2209.	2	4 48
361 Refacing valve of jeep MDJ 2209	8	3 16
362 Rivetting the P.C.U. cone with old segment (D7. 2491).	1	13 58
363 Repairing the mouldign furnace	1	13 56
364 Checking up the leaky barrels	6	3 01
365 Reconditioning the A frame of dozer of D7.	1	52 73
366 Reconditioning the eye bolt of D7. 5822 ..	1	10 72
367 Repairing and welding the air cleaner of D4. 4978.	1	42 91

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
368 Forge welding the H.B. rods	12	62 80
369 Reconditioning the starting engine muffler and welding.	1	16 08
370 Reconditioning the oil guage	1	9 88
371 Reconditioning and welding the frame and of the track roller frame.	3	91 71
372 Reconditioning the bell crank and cleaning the threads.	3	38 70
373 Reconditioning and welding the broken side arm piece.	1	32 02
374 Reconditioning by filling the socket and truning of the push rod.	8	12 72
375 Reconditioning the inner faces of the track roller collar.	16	125 76
376 Removing of the twists of the idler wheel bracket.	4	26 80
377 Cleaning and reconditioning the threads of the idler wheel collar.	1	22 80
378 Welding the body base by chammeling the cracks of the hydraulic pump assembly.	1	46 81
379 Reconditioning the worn out faces of the track rollers.	4	55 39
380 Reconditioning the worn out faces of the ball crank link.	1	20 00
381 Welding and reconditioning the clutch release collar.	1	17 40
382 Rebuilding by welding the surface of the cutting edge of the 15" regular bit.	1	105 64
383 Reconditioning the carrier roller of D7. 3926.	2	23 48
384 Reconditioning the corner blades	2	17 10
385 Fixing up locking arrangement for the rain guage.	1	6 56
386 Providing nipples and nuts for gas cylinder regulator from hose con. of metal spray.	2	14 82
387 Reconditioning the gate valve	1	29 94
388 Providing and reconditioning the bushes for shackles of lorry MSC 9638.	4	33 42
389 Reconditioning the fitting the starting clutch bush of D4. 4978.	..	5 84
390 Removing the crank shaft gear and assembling new gear wheel.	1	6 36
391 Reconditioning and welding the holder bracket.	1	31 64
392 Reconditioning and welding the Jar of DD. 7	1	17 95
393 Reconditioning the hydraulic pump flange..	1	20 76
394 Reconditioning and welding the street shoe plates.	..	33 80

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)
		RS. RP.
395 Reconditioning the master pin of D7. 8078..	1	11 58
396 Reconditioning the radiator of D7. 3926 ..	1	53 58
397 Soldering the radiator of D7. 8078 ..	1	94 82
398 Cutting and threading the bolts of 3" long for D7. 628.	6	12 72
399 Removing the bevel of 10" slip socket bowl..	1	7 86
400 Repairing and set right the trolley ..	1	23 64
401 Reconditioning the carrier roller shaft of D7. 8078.	1	36 06
402 Reconditioning the corner blades of D7 ..	4	151 76
403 Reconditioning the trunion bearing of D7 ..	2	8 44
404 Reconditioning the idlershaft of D7 ..	18	103 00
405 Reconditioning the sprocket wheel and rivetting the guard of D7. 5822.	1	70 00
406 Providing dummy for engine block of lorry MSC 9551.	2	12 66
407 Providing washer inside of holder assembly	1	9 46
408 Removing bearing sleeve from jack shaft housing of DD. 6.	3	9 88
409 Providing main cover for the silencer of R.N. engine.	1	4 48
410 Providing belt adj. bolt and nut welded in channel.	4	35 96
411 Servicing the radiator of DD7. drill ..	1	39 98
412 Welding the track link and providing strips to grouser plates.	37	1,320 58
413 Repairing and replacing the side plates of DD. 6. drill.	2	35 50
414 Reconditioning and repairing the deris post and welding angle.	1	27 94
415 Soldering the bellous seal for D7. 3872 ..	3	8 40
416 Cutting the track links of D7. 7052 ..	8	13 26
417 Repairing and side bar of M.S. Cart ..	1	12 34
418 Reconditioning H.O.D.E. roller of D6. 2506	8	67 64
419 Reconditioning the S.F. rollers of D6. 2506	4	73 76
420 Reconditioning clutch cover bottom ..	2	8 96
421 Welding the arm assembly of D6. 2506 ..	2	43 72
422 Reconditioning the clutch bottom cover lever shaft.	1	19 44
423 Reconditioning and welding the yoke and rod.	2	4 94
424 Reconditioning and exhaust pipes of D6. 2506.	2	20 86
425 Reconditioning the water pump shaft key for D7.	1	4 48
426 Reconditioning and drilling holes in draw bar.	1	10 16

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)
		RS. RP.
427 Reconditioning the clutch pedal pin and providing bush for lorry MSC. 9551.	2	14 92
428 Soldering the radiator of lorry MSC. 9551 ..	1	55 56
429 Reconditioning the dynamo adjustment bolts of jeep MSZ. 4203.	2	7 51
430 Reconditioning and welding the spring leaf of D6.	1	25 26
431 Reconditioning the steering lever housing of D6.	1	13 44
432 Reconditioning the carrier roller shaft of D4. 4978.	2	27 32
433 Reconditioning the master bush at worn out place.	1	11 27
434 Reconditioning the master pin of D7. 5822.	1	10 88
435 Providing protection covers for gate valves in pipe line.	..	63 40
436 Providing shutters for main cement water channel.	..	..
437 Servicing the radiator of lorry MSC. 2419 ..	1	54 84
438 Attend patch up work to mudguard the bonnet of lorry MSC. 2419.	..	123 64
439 Reconditioning and groove cutting to rods of D4. 4180.	2	4 48
440 Welding the drill jar at cracked portion ..	1	28 16
441 Repairs and soldering the leaky portion of steam oven.	1	74 56
442 Repairing the stands of water both. ..	2	31 64
443 Reconditioning the body of the blower and shaft to suit new bearings of drill DD. 10.	1	13 28
444 Welding and reconditioning the S.F. rollers of D7. 4180.	6	72 86
445 Welding and reconditioning the D.F. rollers of D7. 4180.	3	27 67
446 Removing the broken lock and fitting another lock.	1	3 93
447 Reconditioning and welding the springs guide of D4. 4978.	2	8 35
448 Welding and reconditioning the pin holes of levers DD. 4978.	5	20 24
449 Cutting grooves in the valve steam of lorry MSC. 9594.	6	8 96
450 Reconditioning and welding the holder bracket of D7. 6298.	1	70 64
451 Refacing the valves of D7. 4180 ..	1	4 48
452 Reconditioning and welding the hydraulic press bolts of guage.	2	20 18
453 Providing studs 5/82 and rectifying the pump cover of well No. 40.	4	31 32

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
454 Welding the radiator base and providing holes of RBU VII.	1	100 00
455 Remove bend in radiator side frame of RBU VII.	..	14 47
456 Welding and Reconditioning fuel pump bed of RBU VII.	1	54 18
457 Reconditioning the radiator water house elbow con. or RBU VII.	1	22 18
458 Reconditioning and providing hook to big size RBU VIII.	1	10 02
459 Dismantling and removing parts of jack shaft.	1	18 44
460 Cutting the track bush and size to master bush collar of D7. 7052.	12	6 11
461 Grinding and suit to track bush of D4. 4978	30	12 96
462 D. B. Cart No- 12—Three bolts in the right wheel to be replaced.	3	30 00
463 Repairing the bill hook	1	4 98
464 Repairing the junior hoe	1	8 96
465 Soldering the pins of the earphone ..	2	2 24
466 Repairing the right shaft of the S.B. rubber tyre cart.	1	16 44
467 Removing bend in 3" pipe	..	18 42
468 Valve grinding and providing valve sleeve for cylinder head of lorry MSC. 9594.	2	11 99
469 Providing pulley for lodging stand apartment.	1	4 71
470 Cutting the chain master pin by arc welding of D7. 7052.	1	6 14
471 Reconditioning the clutch finger of welding and fitting of D7. 7126.	3	17 54
472 Rectifying the bend in the con. rod of the pulley of motor.	1	4 48
473 Refacing the valves of MDC. 6775 ..	8	7 17
474 Clutch centre keys to be renewed to jack shaft of DD. 2.	1	28 24
475 Reconditioning the wooden reaper for providing bed to motor well No. 40.	..	9 90
476 Repairing the silencer of lorry MSC. 9594.	1	28 67
477 Repairing the sprayer by replacing leather cup washer.	1	7 50
478 Repairing the tube with nozzle	1	8 75
479 Reconditioning the pullar plate to suit R.N. liver sleeve.	1	5 50
480 Reconditioning the recoil clutch bolt nut D7. 3872.	1	6 34
481 Reconditioning the master plan of D7. 2491.	1	7 04

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
482 Reconditioning the recoil spring bolt ..	..	6 88
483 Reconditioning the air lock cock of the pumpset.	1	11 30
484 Soldering the oil tube of the rocker arm and soldering the vacuum tube and petrol line pin.	..	11 30
485 Rear axle—Broken parts replaced for cobey wagon.	1	44 70
486 Welding the cracked portion in the chassis.	1	71 44
487 Removing bend and welding the cracked portion of wheel disc of cobey wagon.	1	33 16
488 Reconditioning the fuel line pipe	1	6 36
489 Rivetting the P. C. U. Brake band of D7. 3894.	1	8 67
490 Removed broken clutch cover pin and providing new pin for D7. 7052.	..	16 43
491 Facing the F.T. pump body and providing dowel.	..	3 27
492 Reconditioning the buffer lathe of L.P. piston valve.	1	17 38
493 Reconditioning the dynamo bush of M.H. 20 K. Tractor.	1	6 39
494 Repairing the autoclave by placing bolt and nut.	8	69 90
495 Welding and fixing the filter stud of AC. III.	1	16 12
496 Making and drilling holes in the bushes of D7.	4	4 48
497 Eye bolt of tee hook to be enlarged to bigger size with 7/8" rod.	1	16 13
498 Reconditioning the share point of mould board plough.	1	6 14
499 Reconditioning the clutch shaft of the disc plough.	1	17 88
500 Reconditioning the clutch hub	1	15 31
501 Reconditioning the clutch	1	6 36
502 Replacing handles of H/W. purning shears.	4	40 02
503 Reconditioning the corner blades of D7. 8078.	2	59 74
504 Reconditioning the master clutch can of D7. 8078.	3	7 51
505 Welding the frame for the door (Hooks) ..	4	13 73
506 Reconditioning the corner blades	2	39 56
507 Removing the nuts in the recoil spring bolt.	2	6 86
508 Cutting and welding the track chain link and bush.	..	11 36

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)	
			RS. RP.
509 Reconditioning the threads of rod and chain of W. 6 tractor.	1	29 56	
510 Sharpening the crow bar ends	6	27 26	
511 Reconditioning and altering the D7. crown wheel shaft to suit the crown wheel shaft.	1	81 52	
512 Repairing the part of the holder sprayer ..	1	4 48	
513 Fixing the wooden handles for the mathus grooves.	5	8 06	
514 Reconditioning the idler wheel of D6. ..	2	96 17	
515 Reconditioning the sprocket wheel of D6. ..	1	118 30	
516 Reconditioning the idler wheel of T6. ..	1	27 57	
517 Reconditioning the track roller single flanges.	2	17 98	
518 Reconditioning the track roller double flange.	2	28 42	
519 Reconditioning the carrier roller	1	22 88	
520 Reconditioning the centre blade of TD. 14.	2	67 56	
521 Reconditioning the corner blades of TD. 14.	2	4 68	
522 Reconditioning the track roller double flange.	5	28 91	
523 Reconditioning the corner blade T6. ..	1	36 70	
524 Reconditioning the track roller double flange.	1	36 70	
525 Reconditioning the track roller single with shaft.	6	8 86	
526 Reconditioning the carrier rollers of D6. ..	2	18 65	
527 Reconditioning the corner blades	9	48 47	
528 Reconditioning the centre blade of D6. ..	2	36 14	
529 Reconditioning the H/W. sowning blades.	4	11 11	
530 Reconditioning the John Deere tractor silencer.	1	20 16	
531 Welding the flush out tank handle renewal from the freeman building latrine.	1	2 92	
532 Fixing iron rims to the metallic pots ..	10 Nos.	52 34	
533 Reconditioning the union of carburettor of starting engine.	1 No.	6 04	
534 Welding the back door of lorry 9551 ..	..	6 64	
535 Welding the leaky barrel	10 Nos.	5 08	
536 Removing bend in the rod end	1 No.	8 62	
537 Bushing for the master clutch of D7 ..	..	9 61	
538 Welding and rethreading the jack rop cap..	1 No.	17 87	
539 Reconditioning the drum by soldering the leaky portion.	1 ..	4 70	
540 Reconditioning the box h.b. rods	3 Nos.	157 32	
541 Reconditioning the crank case of D4. 4978 ..	1 No.	102 50	

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)	
			RS. RP.
542 Removing and fixing broken stud in the exhaust pipe.	..	4 48	
543 Cutting wooden beam to fit up the motor and pumpset at well No. 50.	4 Nos.	1 97	
544 Fixing up the handle of the automatic dispensing unit.	1 No.	2 79	
545 Cutting and welding the bolts as per sample for D7. 6298.	2 Nos.	3 47	
546 Reconditioning the fuel filter body union ..	1 ..	19 32	
547 Reconditioning the oil circular pipe ..	..	4 42	
548 Reconditioning the water cooler pipe ..	1 No.	4 42	
549 Reconditioning the holder of quasi arc welding set by soldering.	1 ..	2 61	
550 Reconditioning the idler wheel of D7. 8078.	1 ..	79 84	
551 Cutting the asbestos sheet	..	4 48	
552 Bentex spring one end to be bent to hold the screw.	1 ..	1 24	
553 Reconditioning the clutch lever welding and making holes.	1 ..	16 91	
554 Reconditioning the bonnet for D7. 7052 ..	1 ..	11 48	
555 Remetalling the upper bearing	1 ..	17 84	
556 Reconditioning the master pin of D7. 3872.	1 ..	8 03	
557 Reconditioning the master pin of D7. 7052.	4 Nos.	31 27	
558 Welding the water tank	..	9 98	
559 Reconditioning the bushes of D7. 5022 ..	2 Nos.	8 65	
560 Reconditioning the master pin of D7. 5822.	2 ..	18 28	
561 Patch up work for bus MDC 9718	..	27 04	
562 Reconditioning the cream separator ..	..	16 66	
563 Copper ring for HP valve for AG IV ..	4 Nos.	4 48	
564 Copper ring for HP valve for AG III ..	3 ..	4 48	
565 Soldering the cable for hobert welding set ..	..	12 70	
566 Repairs to water still	1 No.	13 28	
567 Reconditioning 403 plough bracket ..	1 ..	4 48	
568 Reconditioning the D7 master pin	2 ..	6 24	
569 Sleeve of the collar to be enlarged ..	1 ..	4 48	
570 Welding of fishing jar	..	18 58	
571 Repairs to ghat tracks	..	4 62	
572 Reconditioning the clutch shaft by giving shims under the disc for D7.	1 No.	7 78	
573 Reconditioning the clutch pressure plate ..	1 ..	15 64	
574 Refacing of steering drum of D7	1 ..	4 48	
575 Repairing to winnowing machine	1 ..	16 86	
576 Reconditioning of D7. chain master pin ..	1 ..	4 94	

APPENDIX—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore,—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		rs. pP.
577 Reconditioning the John Deere fly wheel spines.	1 "	30 48
578 Refacing of water pump shaft	1 "	4 48
579 Reconditioning the pump shaft pulley key way.	1 "	11 20
580 Chaff cutter sharpening of	4 Nos.	2 24
581 Clutch bearing collar to be reconditioned	1 No.	4 94
582 Repairs to cutting machine (Racine)	1 "	25 44
583 Bull reals—crack portion welded	1 "	38 64
584 Reconditioning front idler of D7. 2491	2 Nos.	65 56
585 Reconditioning the steering assembly bushes and fitting of D7. 2491.	4 "	69 56
Reconditioning the clutch pinion lever of both sides for D7. 7052.	1 No.	10 52
587 Reconditioning D7. master pin of D7. 3926.	1 "	6 34
588 Reconditioning pulley chain of garage.	1 "	6 32
589 Reconditioning D7. 3926 master pin	2 Nos.	11 70
590 Reconditioning PCU adjusting rod for D7. 7052.	1 No.	13 20
591 Soldering the petrol can of D7. 7052	1 "	7 22
592 Spudding pinion bush to be enlarged to suit the jack shaft to DD6.	1 "	5 80
593 3/8" studs to be removed from the engine block DD6. and refixing for DD6. drill.	2 Nos.	4 48
594 Cutting and threading the 2½" pipe	8 pieces.	22 00
595 Reconditioning D7. 3872 track master pin	2 Nos.	4 94
596 Reconditioning D7. 7052 front idler wheel	1 No.	25 20
597 Reconditioning brake pedal shaft and removing broken studs.	2 Nos.	3 59
598 Reconditioning and silencer welding	1 No.	0 72
599 Removal of fencing around the drilling stores.	2 Nos.	1 90
600 Bentix spring to be bend for DD10	1 No.	4 94
601 Reconditioning D7. 2491 sprocket wheel	1 "	70 14
602 Reconditioning D7. 2491 sprocket wheel	1 "	65 20
603 Soldering the fannel for MSZ 165 john Deere tractor.	1 "	11 58
604 Reconditioning the exhaust pipe of J.D. MSZ 165.	1 "	17 20
605 Lynch set main shaft:—side support to be welded and provided a hole to suit the shaft.	1 "	34 96
606 Reconditioning D7. track roller frame sent.	2 frames.	25 3
607 Reconditioning track roller and carrier rollers of D7. 7052.	12 Nos.	241 0.
608 Reconditioning track rollers of D7. 2491	10 "	193 42

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.	Quantity.	Amount.
(1)	(2)	(3)
		rs. pP.
609 Reconditioning front idler shaft, idler wheel and idler collar of D7. 7126.	4 Nos.	109 85
610 Reconditioning jeep back spring MDC 9594.	2 "	14 12
611 Side plate lever removed from the shaft and welded for DD6.	1 No.	4 94
612 Reconditioning the A.C. Pump lever of jeep 9594.	1 "	6 36
613 Bull rod hand reduced by 1'—0" length for DD6.	1 "	5 88
614 Reconditioning 4" check valve for oil engine.	2 Nos.	71 96
615 Track roller chasis:—Removed old strips and fitting of new strips for D7. 2491.	4 "	49 74
616 Reconditioning clutch yoke of D7. 5822	1 No.	20 80
617 Reconditioning D7. 5822 radiator	1 "	83 94
618 M.B. rod:—Reconditioning	3 Nos.	42 66
619 Cutting the 4" pipe as per instructions	3 pieces.	8 96
620 Soldering the mouth of 43 tins of tree killer medicine.	43 tins.	12 42
621 Cutting the zinc sheet into pieces	12 Nos.	22 40
622 Refacing the starting engine valve D7. 5822.	8 "	2 62
623 Refacing the main engine valves D7. 5822	8 "	2 62
624 Removed the broken studs and providing studs for the same of oil engine.	2 studs.	14 60
625 Reconditioning the furrow wheel cup of 503 plough.	1 No.	24 66
626 Repair of liquid shaker	1 "	19 34
627 One stud to be provided after removing broken one to suit oil pump.	1 "	2 30
628 Drilling the holes of track roller bushes D7. 2491.	13 Nos.	4 48
629 Stanley lathe repairs	..	11 00
630 One filler cap reconditioning of A.C. III	1 No.	2 62
631 Reconditioning the 4" coir filter point with 2".	2 Nos.	2 00
632 Soldering the float of tank guage	1 No.	2 30
633 Reconditioning the D4. clutch collar	2 Nos.	14 98
634 Reconditioning the D7. 5822 front idler	2 "	95 18
635 Reconditioning D7. 5822 master pin	1 No.	8 88
636 Reconditioning D7. 5822 yoke pin	1 "	5 48
637 Rethreading the disc harrow pipe	1 "	5 50
638 Reconditioning the master pin of D7. 7052.	1 "	10 04
639 Reconditioning and rethreading one air on sleeve nut as per sample for DD6.	1 "	5 74
640 Pinion glass to be reconditioned	1 No.	4 48
641 Reconditioning jar of DD7	2 Nos.	29 72

APPENDIX 22.

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 descriptions.	Quantity.	Amount.
(1)	(2)	(3)
		RS. RP.
642 Reconditioning the pin of gear shaft lever D7. 5822.	1 No.	5 24
643 Reconditioning the clutch centre of jack shaft of DD2.	1 „	20 42
644 Reconditioning front idler collar D7. 5822 ..	2 Nos.	35 80
645 Reconditioning D7. 3926 track master pin.	2 „	8 96
646 Reconditioning knap sack sprayer pruning shear and crow bar (bolt).	3 „	17 74
647 Soldering the hollow seal for D7. 2491 ..	1 No.	6 36
648 Reconditioning D7. 3872 front idler ..	2 Nos.	54 48
649 Reconditioning D7. 4180 front idler collar ..	4 „	36 06
650 Welding the disc harrow set bracket and filing.	1 No.	15 26
651 Shaking machine wing nut supplying and repairs to beams etc.	2 beams.	16 84
652 Soldering the fuel tube of R.B.U. III ..	2 pipes.	6 30
653 Making one door hook zinc sheet etc ..	1 No.	13 74
654 Reconditioning D7. 8078 sprocket wheel ..	1 „	66 21
655 Reconditioning carrier roller shaft of D7. 2491.	4 „	42 84
656 Reconditioning of pitman washer (4½ C.D. 3-1/16")	1 No.	2 88
657 Reconditioning grease nipple extension of D7. 7052.	2 Nos.	5 24
658 Reconditioning the disc harrow bushes ..	2 sets.	63 71
659 Welding the turbine pump base	1 No.	8 96
660 Reconditioning master pin of D7. 3894 ..	1 „	10 00
661 Making holes in D4. track bushes	14 Nos.	1 58
662 Repairs and reconditioning of 4" check valve.	1 No.	4 48
663 Reconditioning D7. 4180 front idler ..	2 Nos.	215 79
664 Reconditioning 4" pipe coupling welding filter point.	1 No.	10 20
665 Reconditioning the 4" pipe with flange ..	2 Nos.	4 58
666 Reconditioning carrier roller D7.4180 ..	3 „	45 67
667 Providing lever over the P.C.K. seal for D7. 3926.	1 No.	8 22
668 Reconditioning the 4" check valve for filter point.	1 „	5 74
669 Removing broken studs, filling up the holes and making threads etc.	8 holes.	14 10
670 Reconditioning carrier roller of D7. 8078 ..	1 No.	8 18
671 Reconditioning track adjusting screw bracket.	1 „	9 26
672 Reconditioning hydraulic jack lever etc ..	1 „	10 18
673 Mandrill.—hole enlarged to suit ½" wire rope for PD9.	1 „	3 16

APPENDIX 22—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 descriptions.	Quantity.	Amount.
(1)	(2)	(3)
		RS. RP.
674 Oil barrel of PD9. repaired	1 No.	5 96
675 Soldering the funnel of D7. 7052	1 „	10 60
676 Reconditioning track chain adjusting bolt and nut D7. 7052.	1 „	18 77
677 PD2. clutch centre reconditioning	1 „	15 44
678 Welding the broken shaker clamp of the winnowing machine.	1 „	2 47
679 Repairs to stop cock	1 „	19 08
680 Reconditioning the heel glass assembly libo and C. bellows of D7. 2491.	1 „	6 36
681 Refilling pin holes of break pedals and clutch lever drilling, etc., for D7. 2491.	3 Nos.	8 38
682 Replacing the mouth of the starting engine of AC III.	1 No.	10 16
683 Lorry MSC 9638 :—Spring campering and fitting up.	1 set.	6 06
684 Reconditioning the hook bolt of massey harris plough clutch 503 plough.	1 No.	1 88
685 Painting the drill derrick engine	1 „	57 59
686 Repairing the Burmese sattu	2 Nos.	158 19
687 Welding the track chain assembly and providing strips to grouser plates of D7. 4180.	20 „	1,402 47
688 Reconditioning the front idler shaft ..	1 No.	35 08
689 Reconditioning the track roller single flange.	7 Nos.	202 82
690 Reconditioning the track roller double flange.	12 „	474 25
691 Reconditioning the centre blade of D6 ..	2 „	107 22
692 Reconditioning the bracket with trunion ..	2 „	7 74
693 Reconditioning the clutch shaft welding the portion of the shaft and trunion to suit the clutch shaft.	1 No.	60 06
694 Sprocket hub reconditioning of D7. ..	1 „	185 68
695 Dull real shaft ends to be built up and turned to suit holes on wheel of DD6.	1 „	57 66
696 Reconditioning 2 wheel trailer draw bar bracket.	„	91 06
697 Soldering the fuel pipe of oil engine ..	1	4 51
698 Repairs to foot pump	1	4 62
699 Welding the silencer muffler of lorry MSZ. 2419.	1 „	10 42
700 Reconditioning the centre blade of D7. 5822	1 „	57 54
701 Repairing of flat valve boiler DD10 ..	1 „	29 63
702 Making holes in washers (1/8" thick) ..	2 Nos.	5 97
703 Threading 3" pipe	3 „	11 09

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ADMINISTRATION REPORT OF THE

APPENDIX 22—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 descriptions. (1)	Quantity. (2)	Amount. (3) Rs. & P.
704 Welding the 3" pipe	3 Nos.	3 47
705 Check valves conversion to foot valve in a coupling.	1 No.	9 98
706 Derrick post 'L' angle piece to weld at top portion providing plates to arrest the union derrick of DD6.	12 Nos.	119 56
707 Valve boiler repaired and drilling jar welded	3 "	18 86
708 Reconditioning the body of hour motor counter assembly body of D4.	2 "	4 48
709 Providing hood cloth for D7. 2491	1 No.	40 00
710 Reconditioning the front and back seat ..	1 set.	40 00
711 Lawn mover repairs	1 No.	32 03
712 Cylinder reboring machine repairs	1 "	19 83
713 Drilling shaft frame to be bent	1 "	39 12
714 Reconditioning radiator with oil cooler ..	2 set.	184 90
715 Exhaust manifold assembly removing broken studs and fixing new pipe.	3 Nos.	83 88
716 Reconditioning bell crank of D4	1 No.	8 94
717 Reconditioning the corner blades of D4 ..	12 Nos.	135 02
718 Reconditioning the centre blades	3 "	125 06
719 Reconditioning the idler wheel collar of D4.	7 "	20 56
720 Reconditioning the worn out packing portion in hydraulic pump joint assembly.	1 No.	5 08
721 Fitting the refacing to original size of assembly brass bush.	1 "	56 62
722 Reconditioning the D4. clutch can	4 Nos.	4 48
723 Refacing the steering collar	1 No.	4 48
724 Welding the hour-o-meter	1 "	5 08
725 Reconditioning and welding lorry tyre drum.	1 "	14 28
726 Welding the silencer of John Deere tractor MSZ. 165.	1 "	3 70
727 Reconditioning draw bar of two wheels ..	1 "	27 06
728 Providing brake lining for sand reel PD9. drill.	1 "	35 72
729 Reconditioning of idler wheel TD9	1 "	9 42
730 Reconditioning the TD9. sprocket wheel ..	1 "	73 10
731 Reconditioning D6. sprocket wheel	1 "	14 04
732 Reconditioning double flange rollers	2 Nos.	57 42
733 Reconditioning end bit of D6	2 "	42 24
734 Reconditioning single flange rollers of D6 ..	2 "	55 44
735 Reconditioning single flange rollers with shaft.	1 No.	18 04
736 Reck salt drilling holes	10 Nos.	1 00
737 Refacing valve inter of blasting unit ..	8 "	2 68
738 Reconditioning the yoke check collar	1 No.	5 80

APPENDIX 22—cont.

List of reconditioned articles for the year ending from 1st July 1960 to 30th June 1961 at the Tractor Workshop, Coimbatore—cont.

Serial number and descriptions. (1)	Quantity. (2)	Amount. (3) Rs. & P.
739 Providing bushes for sleeve pin of sand reel of DD6.	2 Nos.	8 72
740 Providing nut and replacing check nuts union from the old pipe.	1 No.	6 36
741 Repairing the water pump of DD9	1 "	13 00
742 Providing 2 Nos. supports side plate in the oven derrick for DD6.	2 plates.	12 52
743 Reconditioning the flat valve boilers	3 Nos.	106 40
744 Cutting the joints	2 "	2 39
745 Repairs to shaper	1 No.	1 59
746 Reconditioning idler wheel collar pin end nut D7. 8078.	4 Nos.	1 58
747 Reconditioning draw bar eye bolt	1 No.	16 72
748 Reconditioning carrier rollers of D7. 8078 ..	2 Nos.	21 75
749 Reconditioning the carrier roller spacer of D7. 8078.	3 "	8 98
750 Fushing of milico phosphate	1 bag.	120 00
751 Drilling holes on flanges	10 Nos.	13 44
752 Reconditioning the track rollers of D7. 8078.	5 "	37 67
753 Rivetting the guard of sprocket wheel of D7. 8078.	1 No.	18 42
754 Reconditioning the radiator base of lorry MSC 9551.	1 "	12 30
755 Repairs to lorry MSC 9551	1 "	12 24
756 Reconditioning D7. 8078 carrier roller shaft.	1 "	15 64
757 Dismantle armature shaft bearing the threads of lorry MSC. 9551.	1 "	1 31
758 Reconditioning and threading 3" pipe	2 Nos.	2 75
759 Reconditioning front idler for D7. 8078 ..	1 No.	82 72
760 Reconditioning the D4. bearing dowl	1 "	1 31
761 Reconditioning D7. 7126 master pin	2 Nos.	5 58
762 Bending the centre blade of D7. 3926	1 No.	3 24
763 Repairs to copper still	1 "	13 54
764 Reconditioning the water pump flange of rock blasting unit.	1 "	12 89
765 Reconditioning track rollers of D7. 3872 ..	5 Nos.	93 85
766 Soldering the petrol pipe of D7. 4978	1 No.	1 00
767 Reconditioning of master pin of D7. 8078 ..	2 Nos.	6 39
768 Reconditioning water tank trailer (Massey Harrie).	1 No.	10 70
769 Reconditioning carrier roller cup	1 "	3 16
770 Welding the dash board of the bus MDC 9718.	1 "	2 48

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and descriptions. (1)	Quantity. (2)	Amount. (3) RS. NP.
771 Reconditioning the track rollers of D7. 3872.	5 Nos.	55 32
772 Reshaping the grass cutting swords ..	6 „	33 14
773 Reconditioning the centre blades of D7. 3894.	1 No.	64 59
774 Reconditioning the radiator of D7. 7126 ..	1 „	33 38
775 Reconditioning the D7. clutch fingers ..	3 Nos.	2 89
776 Drilling holes in the bushing assembly of D4. 4978.	3 „	1 90
777 Turning the D4. 4978 idler bushing to size.	1 No.	1 90
778 Reconditioning the master pin of D7. 7126.	2 Nos.	18 66
779 Reconditioning and welding the trunion bracket bearing of D7. 7126.	2 „	8 30
780 Reconditioning the corner blade of D7. 3872.	1 No.	17 46
781 Reconditioning the master pin of D7. 3872.	2 Nos.	7 94
782 Re-erecting the bowers and modification ..	4 „	166 23
783 Wooden sleepers for hynich set as per samples.	2 set.	60 12
784 Reconditioning the back and front seat of D7. 7126.	1 No.	44 50
785 Reconditioning the corner blades of D7. 7126.	2 Nos.	50 70
786 Reconditioning the centre blades of D7. 7126.	3 „	210 00
787 Welding and grinding the equalizer spring leaf and making brackets, etc., of D7. 7126.	3 „	51 68
788 Repairs to wooden arm chair	1 No.	6 26
789 Reconditioning the pump bed by extending the oval hole by cutting the pump bed.	1 „	7 17
790 Screw driver wooden handle replacing of DD. 6.	1 „	1 31
791 Drilling holes to track roller bushing D7. 3872.	4 Nos.	2 47
792 Welding the hydraulic press handle collar, etc.	1 No.	8 96
793 Cutting the 4" G. I pipe into pieces ..	6 pieces.	6 16
794 Welding the check valve flanges in coupling and metaling crack valve, etc.	2 Nos.	13 82
795 Repairs to Aligar locks	2 „	10 65
796 Welding the water pipe of D4. 4978 ..	1 No.	5 02
797 Jack hammer handle repaired to suit the shaft.	1 No.	2 47
798 Removing the broken studs in the base plate and welding the holes to 5/8" size.	1 No.	3 16

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and descriptions. (1)	Quantity. (2)	Amount. (3) RS. NP.
799 Soldering the plug wire.	2 Nos.	4 28
800 Soldering the welding cable of Quasi Arc welding.	2 „	10 30
801 Reconditioning the corner blades of D7. 3894.	2 Nos.	23 14
802 Welding the hub of water pump plate of D4. 4978.	2 Nos.	11 65
803 Repairs to hydraulic servicing press ..	1 No.	14 12
804 Rethreading D7. disc tank bottom stop ..	6 Nos.	17 24
805 Reconditioning the coupling of pump re-boring and installing sleeve and making key way, etc.	1 No.	8 37
806 Reconditioning D7. track master pin ..	1 „	33 98
807 Soldering the field coil terminal of seal and starter of lorry MSC 9551.	1 No.	1 60
808 Trap rest box repairs	2 Nos.	31 94
809 Repairs to rose cane funnel and pipe ..	2 „	8 66
810 Pruning shears repairs to handle, etc. ..	1 No.	3 16
811 Repairs to lawn mover	1 „	12 72
812 Reconditioning and welding S.I. pulley pin and turning to size.	1 „	8 66
813 Providing side supports to spring by giving plates and welding front axle, etc., R.B. VII.	2 plates.	6 50
814 Cutting and threading of 3" pipes ..	2 threads.	1 38
815 Reconditioning the track master pin of D7. 4978.	1 No.	8 13
816 Reconditioning the D7. radiator	1 „	24 14
817 Repairs to pruning shears, replacing bolts and nuts sharpening and straighting.	4 Nos.	3 52
818 Reconditioning the track master pin of D7. 7052.	2 „	11 42
819 Reconditioning the exhaust muffler of R.N. oil engine.	2 „	28 06
820 Welding 4" bend with 4" coupling of oil engine side.	1 No.	2 39
821 Reconditioning the grease nipple extensive tube by drilling holes and making threads etc., of D7. 4180.	2 Nos.	4 76
822 Trap nest boxes repairs	3 „	17 98
823 Heavy wrench lever crank welded DD. 10.	1 No.	11 70
824 5/8" boiler repairs DD10	1 „	19 86
825 Reconditioning the starter pinion of D7. 8078.	1 „	9 84
826 Providing handles and sharpening of blades.	3 Nos.	3 18
827 Reconditioning the track adjustment bolt and nut of D6.	1 set.	17 61

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and descriptions. (1)	Quantity. (2)	Amount. (3) Rs. RP.
828 Threading the 3" pipe	1 No.	3 50
829 Welding the shakes handle of winnowing machine.	1 "	3 32
830 Repairs to centre bower dome and making arches.	2 Nos.	149 36
831 Single bullock cart—Replacing of right hand broken wooden hub and renewal of rubber tyres.	1 No.	2 7 4
832 Reconditioning the track roller shaft ..	5 Nos.	98 43
833 Reconditioning the clutch pressure plate of D6.	2 "	23 56
834 Reconditioning track shoe plates of D6. ..	3 "	237 28
835 Reconditioning track roller collar of D7. 2491.	9 "	129 89
836 Reconditioning carrier roller shaft of D7. 4180.	3 "	2 70
837 Reconditioning fishing jars	4 "	112 76
838 Reconditioning seatire manuties and brackets.	6 "	30 98
839 Reconditioning front idler shaft of D7. 4180 D.	2 "	103 20
840 Repairing the jaggery pun and water tank.	2 "	179 12
841 Reconditioning front idler wheel of D7. 7126.	1 No.	78 45
842 Lever providing for the studs backer truck.	5 Nos.	13 14
843 Rethrading and shaping the size three coil spring bolt of D4.	1 No.	12 76
844 Reconditioning front idler wheel of D7. 6298.	1 "	58 34
845 Reconditioning the sprocket wheel of D7. 7126.	1 "	90 38
846 Reconditioning the sprocket wheel of D7. 8078.	1 "	200 00
847 Removing oil cooler broken bolt of D7. 3872.	1 "	6 64
848 Reconditioning the radiator top and bottom removal, cleaning, etc., D7. 3872.	1 "	150 00
849 Soldering the oil pipe of D7. 3894	1 "	1 58
850 Lock pin racket assembly	3 Nos.	1 58
851 Repairs to gate post and arches	2 "	126 61
852 Providing adopter in the P.C.U. cover key welding D7. 3926.	1 No.	5 31
853 Reconditioning radiator bed providing bolts after removing broken bolts.	1 "	4 48
854 Repairs to trap nest boxes	4 Nos.	17 32
855 Welding the broken wheel of the victory plough.	1 No.	16 30

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and descriptions. (1)	Quantity. (2)	Amount. (3) Rs. RP.
856 Rethrading the fuel injection chamber ..	1 No.	1 58
857 Reconditioning D7. 7052 chain master pin.	2 Nos.	14 44
858 Cutting the old gas house sheets for lables (4" x 6").	1,000 "	258 51
859 Reconditioning the starting handle providing a pin and welding etc.	1 No.	2 47
860 Reconditioning carrier roller of D7. 3926 ..	2 Nos.	62 68
861 Reconditioning the door of van MSY 3808.	4 "	40 40
862 Repairs to drilling jar	1 No.	21 86
863 Reconditioning track rollers of D7. 3894 ..	2 Nos.	37 05
864 Soldering and brazing the fuel pipe of D7. 3926.	1 No.	6 06
865 Trap nest boxes repairs	3 Nos.	8 27
866 Reconditioning the master pin of D7. 2491.	2 "	17 89
867 D7. Equalizer spring clamp cutting to size and welding.	1 No.	7 42
868 Repairs to bullock cart wheel	1 , ,	4 48
869 Crankshaft grinding to suit the connecting rod journal.	1 No.	11 48
870 Repairs to M. H. Tractor draw bar ..	1 "	23 24
871 Providing handle for screw driver	1 "	1 58
872 Providing self starter bushes	2 Nos.	4 00
873 Removing old bushes and providing new bushes.	1 No.	5 00
874 Making holes on flat of draw bar of J. D. MSZ 165.	4 holes	6 64
875 Truning the brake drum of jeep MDU 1231.	4 Nos.	5 50
876 Repairs to measuring chain handle.. ..	3 "	4 48
877 Soldering the self starter bushes	4 "	6 64
878 Reconditioning the sleeve block welding the crack portions of the block of R. N. oil engine ICF. 5312.	1 No.	93 06
798 Renewal of new carborandum grinding stone to pedestal grinder.	1 "	10 12
880 P.C.U. back cone lining and rivetting of D7. 7052.	1 "	6 36
881 Removal of broken bolt from the clutch centre shaft.	1 "	4 78
882 Reconditioning the main clutch fingers ..	3 Nos.	24 26
883 Providing self starter bush	1 , ,	3 00
884 Reconditioning the lub. oil filter of R.N. 3150.	1 No.	12 72
885 Reconditioning the bonnet of jeep MDC 8501.	1 "	4 04
886 Repairs to trap nest boxes	2 Nos.	11 57
887 D7. clutch shaft, back brake lining, removing and rivetting with a shim D7. 4180.	1 No.	12 72

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and descriptions. (1)	Quantity. (2)	Amount. (3) RS. RP.
888 Reconditioning the A. frame, welding to size and giving supports, etc., for D7. 2491.	1 No.	51 05
889 Rivetting front P.C.U. brakes facing the band of D7. 8078.	1 „	8 96
890 Providing teeth by welding, turning and shaping to size P.C.U. main shaft D7. 8078.	1 „	49 61
891 P.C.U. back cone rivetting with lining ..	1 „	31 56
892 Reconditioning clutch centre DD. drill 2 ..	1 „	142 36
893 Removing the broken wire rope	1 „	1 58
894 Fuel oil funnel—Soldering and providing a filter nut DD. 2.	1 „	5 00
895 Reconditioning clutch hub of D7. and machining.	4 Nos.	72 25
896 Reconditioning chasis by removal of broken bolts, etc., making threads.	2 „	79 21
897 Welding D.F. roller and shaft	4 „	42 42
898 Welding front idler wheel with shaft ..	4 „	99 20
899 Reconditioning cylinder head-setting valve and sleeve and cutting seating, etc ..	1 No.	4 48
900 Reconditioning drivers seat	1 set	55 00
901 Reconditioning engine bonnet	2 Nos.	14 96
902 Welding the dozer channel of D4	1 No.	17 70
903 Reconditioning exhaust manifold	1 „	15 00
904 Key way making for clutch shaft	2 Nos.	5 76
905 Welding the silencer of lorry MSZ 2419 ..	1 No.	2 39
906 Soldering self starter bush to bus 9718 ..	2 Nos.	3 22
907 Reconditioning grouser plates of D.6 ..	..	270 00
908 Welding mudguard of jeep MSZ 5048 ..	3 patches	6 52
909 Reconditioning the pump shaft	1 No.	14 38
910 Reconditioning the pump bushing	1 „	20 28
911 Reconditioning the pump gland flange ..	1 „	21 01
912 Soldering the plug wire terminal of D7. 2491.	4 Nos.	3 22
913 Reconditioning the radiator of D7. 7126 ..	1 No.	155 00
914 Turning and polishing brake drum of van MSY 3808.	4 Nos.	5 50
915 Bendix spring made bent to provide studs.	3 „	4 96
916 Soldering the water hose pipe of D4. 4978.	1 No.	2 32
917 Making holes in track roller bushing D7. 3894.	44 Nos.	4 78
918 Repairs to locking system of the Godrej cabinet with sliding drawers.	1 No.	4 48
919 Repairs to double bullock cart	1 „	25 00

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. RP.
920 Repairs to body bend in angle and welding hooks and other minor repairs to bullock cart.	1 No.	51 84
921 Reconditioning the pump shaft of oil engine.	1 „	21 30
922 Reconditioning the fuel filter unions to R.N. 10F. 5312.	1 „	6 00
923 Providing a side screen clamp with rod for jeep MSZ 5048.	2 Nos.	11 18
924 Reconditioning the drilling jar of DD. 6 ..	1 No.	14 44
925 Hobart welding set soldering, etc.	1 „	4 94
926 Reconditioning the P.C.U. gear cutting D7. 8078.	1 „	17 42
927 Rivetting the brake P.C.U. band	1 „	13 44
928 Front P.C.U.—Hub portion welding and turning D7. 8978	1 „	7 18
929 Welding the gate bar	1 „	1 97
930 Reconditioning the track roller of D7. 8078.	5 Nos.	68 64
931 Rivetting the P.C.U. cone with lining ..	1 No.	17 24
932 Welding the track frame of D7. 8078 ..	1 „	75 32
933 Rivetting the strips of the track frame of D7. 8078.	2 Nos.	17 92
934 Welding the broken leaf of the equalizer leaves D7. 8078.	1 No.	2 39
935 Reconditioning the bonnet of D7. 8078 ..	1 „	11 36
936 Removal of broken bolt from the front P.C.U. body of D7. 8078.	1 „	8 96
937 Welding the drilling jack	1 „	12 14
938 Threading the nipple of sump pump on each side.	2 Nos.	10 00
939 Providing shims for lock P.C.U. cone ..	1 No.	6 86
940 Welding the drilling jar	1 „	12 10
941 Providing one channel with one adjustment bolt.	1 „	21 22
942 Turning one shaft for sharpening the milling cutter.	1 „	22 00
943 Turning D.4. cylinder head valve inserts ..	3 Nos.	14 28
944 Spudder welding and lines removed from the housing and refilling DD. 2	..	180 82
945 Welding the high pressure tank No. 3 ..	..	9 88
946 Clutch adjustment hub dowel pin reconditioning D7. 4180.	1 No.	2 62
947 Reconditioning foot rest plates	2 Nos.	3 50
948 Welding the clutch cover of D7. 8078 ..	1 No.	3 09
949 Track master pin reconditioning	2 Nos.	7 88
950 Repairs to push cent providing handle to bill hook.	1 No.	7 22
951 Reconditioning the silencer muffler extension D7. 8078.	1 „	10 00

APPENDIX 22—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. (1)	Quantity. (2)	Amount. (3) Rs. & P.
952 Reconditioning the petrol drums providing caps and lid.	3 Nos.	11 02
953 Drilling holes and fitting up the hood for D7. 7126.	1 No.	20 40
954 Reconditioning corner blades of D7. 7126 ..	1 "	15 60
955 Welding equalizer spring of D7. 8078 ..	3 Nos.	45 92
956 Reconditioning air cleaner filter removal of bolts and providing nut, etc., for D7. 8078.	1 No.	6 00
957 Reconditioning carrier roller of D7. 8078 ..	3 Nos.	51 66
958 Reconditioning the broken bolts from the clutch shaft of D7. 2491.	2 "	5 22
959 Cutting the track bushes of D7. 7121 ..	2 "	4 78
960 Soldering liner to suit the liner block ..	1 No.	22 80
961 Providing iron knob for steering lever D7. 8078.	3 Nos.	6 00
962 Grinding the W.D. 9 crankshaft	1 No.	30 00
963 Welding the pipe of 10" diameter	4 Nos.	30 66
964 Drilling holes in roller bushing D7. 8078 ..	2 "	3 32
965 Soldering the sprayer	1 No.	3 32
966 Reconditioning track roller shaft	12 Nos.	210 00
967 Reconditioning idler collar of D7. 8078 ..	2 "	60 00
968 Reconditioning the front idler shaft D7. 3872.	1 No.	56 00
969 Repairs to flat valve	1 "	33 50
970 Repairs to south bend latho	1 "	75 00
971 Key way making to the crankshaft	2 Nos.	13 07
972 Rethrading the connecting rod shells and to suit crankshaft.	1 set.	10 00
973 Reconditioning D4. track rollers	5 Nos.	56 65
974 Repairs to sabour plough handle welding junior hoe and repairs to push cart.	3 "	33 59
975 Repairs to hand operated jins	2 "	12 72
976 Repairs to the radiator of jeep MSZ. 4203 ..	1 No.	2 24
977 Reconditioning cap of petrol pump	1 "	2 62
978 Welding the side body of lorry MSC 9612.	1 "	19 13
979 Drilling holes in bonnet of D7. 9872	14 holes.	3 80
980 Soldering the mouth of the 'Agritree' killer.	38 Nos.	12 88
981 Rivetting the side plates of hatsuta dusters.	9 "	37 48
982 Repairs to handle of the hatsuta dusters and making holes on bracket washers (106 holes).	1 No.	16 40
983 Heavy wrench enlarged	1 "	11 48
984 Repairs to F.U. Boiler of D.D. 6	1 "	24 26
985 Rethrading the hydraulic press piston pin and nut.	2 Nos.	5 59

APPENDIX 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) Rs. & P.
986 Soldering the four gallon jerry can of J.D. tractor.	1 No.	6 72
987 Welding the leaky barrels	10 Nos.	6 52
988 Reconditioning track roller frame (chasis) of D4.	3 "	99 60
989 Reconditioning track roller shaft D4. ..	7 "	127 33
990 Reconditioning welding and filling D7. crank case.	1 No.	95 82
991 Welding the P.C.U. Band cover	1 "	3 32
992 Providing one self starter bush for lorry 9551.	1 "	5 58
993 Welding the steering support channel of lorry MSZ. 2419.	1 "	9 80
994 Reconditioning D7. track master pin of D7. 7126.	1 "	8 94
995 Straightening the 8" strip socket strips ..	1 "	3 70
996 Welding barrels	1 "	2 98
997 Providing idler shaft lock	1 "	4 78
998 Cutting the chasis for providing support to gear box at workshop.	..	42 94
999 Providing dynamo bush for jeep MSZ 4203.	1 No.	5 98
1000 Cutting lables	100 Nos.	35 00
1001 Rectifying minor defects in P.S.G. 160 pump.	9 "	13 74
1002 Repairs to S.A.R. plow bracket—Thread cleaning and providing bolt, etc.	1 No.	4 48
1003 Reconditioning the centre blade	4 Nos.	140 00
1004 Crankshaft grinding to 30" U.S. 5 R.D. 6 tractor.	2 "	160 00
1005 Providing bracket for clutch horn of jeep MDC 8501.	2 "	4 48
1006 Grinding the crankshaft of jeep MSZ 4203.	2 "	33 88
1007 Fuel tank filing cap welded	1 No.	6 64
1008 Reconditioning front idler wheel of D7. 3894.	1 "	78 86
1009 Repairs to two wheel trailer sub axle ..	2 Nos.	35 94
1010 Repairs to share point of mansoon plough and wooden shaft pole.	1 No.	43 33
1011 Repairs to P.S.G. 36 plough share point and providing wooden yoke pole.	2 Nos.	85 00
1012 Repairs to radiator of jeep MSZ 5048 ..	1 No.	8 64
1013 Reconditioning the dozer pin of D4. 2T 4978.	2 Nos.	2 02
1014 Providing shaft and bushes for steering lever assembly D7. 8078.	1 set.	57 00
1015 Repairs to double bullock cart	1 No.	165 00
1016 Repairs to hand chaff cutter	1 "	19 97
1017 Reducing the size of bolts	3 Nos.	4 94

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)	Rs. P.
1018 Reconditioning track master pin of D7. 3926.	2 Nos.	5 98	
1019 Providing square bushing for starting handle.	1 No.	17 48	
1020 Welding the broken hand vice	1 "	8 28	
1021 Reconditioning the shaft (6B. 9247) ..	1 "	127 94	
1022 Reconditioning the coupling (6B. 9207) ..	2 Nos.	20 18	
1023 Reconditioning track master pin of D7. 5822.	2 "	12 34	
1024 Reconditioning track roller frame of D7. 3894.	2 "	115 63	
1025 Cleaning the threads of holder assembly ..	1 No.	4 48	
1026 Reconditioning the extension shaft of D7. 17.	1 "	7 44	
1027 Cutting the track bush into track master bush.	2 Nos.	6 64	
1028 Reconditioning corner blade of D7. 5822 ..	2 "	45 88	
1029 Reconditioning 'U' frame bolts of D7. 3894.	4 "	4 94	
1030 Reconditioning track master pin D7. 3894.	2 "	10 36	
1031 Patch up work for lorry MSC 9583	1 No.	24 28	
1032 Repairs to radiator of van MDO. 1103 ..	1 "	23 28	
1033 Repairs to side door of van MDC 1103 ..	1 "	4 48	
1034 Reconditioning the radiator of D7. 3894 ..	1 "	19 84	
1035 Reconditioning cylinder head stud of oil engine.	1 "	7 52	
1036 Reconditioning steering drum disc assembly of D. 3926.	1 "	12 46	
1037 Welding and rethreading the yoke adjustment screw of D7. 3926.	1 "	15 98	
1038 Providing bushes for steering bearing collar of D7. 3926.	1 "	5	
1039 Repairs to iron galvanized pot	1 "	1 68	
1040 Reconditioning track roller of D7. 3894 ..	1 "	11 56	
1041 Reconditioning shovel and welding the worn out edges for D4. 6841.	1 "	55 00	
1042 Reconditioning the side arms of D4. 3551 ..	2 Nos.	31 32	
1043 Reconditioning track roller frame D4. 3551.	1 No.	44 89	
1044 Reconditioning the bell crank pin and grease nipple thread of D4. 6841.	2 Nos.	14 94	
1045 Reconditioning corner blades	5 "	20 04	
1046 Reconditioning exhaust manifold	1 No.	13 00	
1047 Reconditioning the track rollers	2 Nos.	13 34	
1048 Reconditioning track roller single flange ..	1 No.	8 94	
1049 Reconditioning roller shafts of D4.	4 Nos.	79 26	
1050 Reconditioning carrier roller of D4.	2 "	16 08	

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3)	Rs. P.
1051 Reconditioning equalizer main spring leaf..	2 Nos.	3 16	
1052 Reconditioning holder assembly bracket ..	2 "	4 48	
1053 Repairs to cream separator	1 No.	12 72	
1054 Reconditioning timing cover washer of jeep MSZ 4203.	2 Nos.	1 58	
1055 Brazing fuel pipe of jeep MSZ 4203	1 No.	3 32	
1056 Providing dynamo bush for van MSY 3908.	1 "	7 64	
1057 Repairs to radiator of lorry 9612	1 "	8 64	
1058 Making key way in the given bush	2 Nos.	5 74	
1059 Reconditioning the base plate and alterations.	..	72 64	
1060 Reconditioning the pulley as per instructions.	1 No.	4 48	
1061 Making strip rivet pins and rivetting strips to track frame of D7. 3894.	..	38 66	
1062 Cutting the track link and bushes of D7. 5822.	1 set.	9 88	
1063 Reconditioning silencer of D7. 3926	1 No.	25 00	
1064 Repairs to bund farmer	2 Nos.	94 68	
1065 Welding the foot steps of jeep MDC 7879 ..	1 No.	2 74	
1066 Alteration to the timing cover of jeep 4203.	1 "	4 48	
1067 Welding the 2" coupling after removing the old one and body welding of the water tank.	1 "	15 68	
1068 Welding the jar of DD6.	1 "	9 22	
1069 Providing bolts to Autoclave	2 Nos.	6 92	
1070 Making key way in the long shaft in one pulley.	2 "	11 48	
1071 Reconditioning the exhaust muffler of A.V. 2 engine.	1 No.	3 16	
1072 Reconditioning keys and shaft of D7. 3925.	2 Nos.	4 94	
1073 Reconditioning track rollers of D7. 6298 ..	10 "	167 22	
1074 Removing the broken studs from the oil cooler of D7. 3894.	1 No.	1 58	
1075 Soldering the radiator of lorry 2419	1 "	6 40	
1076 Reconditioning the corner blade of D7. 2419.	1 "	22 62	
1077 Fitting up the steering bracket assembly with bushing for D7. 3926.	1 set.	11 35	
1078 Reconditioning the radiator of D7. 3894 ..	1 No.	97 96	
1079 Polishing the two pistons to suit the new levers for crossley oil engine 6 H.P.	2 Nos.	5 50	
1080 Repairs to water still.	1 assy.	90 00	
1081 Tapering with 15/16" nuts to suit the wheel disc of John deere tractor.	5 Nos.	2 62	
1082 Resetting the steering assembly of D7. 8078.	1 assy.	6 08	
1083 Threading 3" nipple	1 No.	2 47	

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. RP.
1084 Reconditioning the impeller (Bronze welding and turning to size).	1 No.	20 12
1085 Welding 2" pipe in 44 gallon empty barrels and cutting 2" pipe into 6 pieces.	6 Nos.	10 20
1086 Repairs to wooden gate	1 No.	35 00
1087 Supply of drain plates	4 Nos.	40 00
1088 Threading ½" pipe	10 "	18 22
1089 Cutting and threading 2" pipes	1 No.	2 39
1090 Reconditioning clutch collar and providing pin for the adjustment rod of D7. 3872.	1 set.	2 47
1091 Reconditioning centre blade of D7. 2491 ..	1 No.	126 72
1092 Reconditioning corner blade of D7. 7126 ..	1 "	13 64
1093 Welding the 4" H.B. rod	1 "	5 18
1094 Repairs to gin	1 "	3 16
1095 Built up size to 12" bit	1 "	101 24
1096 Reconditioning the carburatter sprayer ..	1 "	5 99
1097 Replacing broken bottom plates and repairs to gear wheel etc. for D.B. cart.	2 Nos.	30 00
1098 Minor repairs and hood ply-wood replacing for D.B. cart bench.	1 No.	25 00
1100 Fixing the radiator with new core in the old top and bottom tank of jeep MSZ 5048.	2 Nos.	32 75
1100 Providing piston rings for duster as per sample.	2 "	2 62
1101 Welding the back seat of jeep 5048	1 No.	3 01
1102 Removing rotation check for tower part of jack hammer.	1 "	8 96
1103 Rebending to the original size of Bendix spring.	1 "	3 80
1104 Supply of Bendix spring bolts as per sample.	2 Nos.	2 00
1105 Reconditioning and supply of dynamo bush for jeep MDC 8501.	1 No.	5 87
1106 Repairing the dent valve of drill PD. 9 ..	1 "	11 00
1107 Welding and setting the clutch bracket bolt of jeep MSZ 4203.	2 Nos.	3 93
1108 Providing bush for the fly wheel of jeep MDC 8501.	1 No.	7 36
1109 Welding the impeller of pump	1 "	12 60
1110 Reconditioning track roller shaft	10 Nos.	252 30
1111 Reconditioning track roller shaft	10 "	275 66
1112 Reconditioning bell crank link	4 "	31 26
1113 Reconditioning front idler wheel shaft of D4.	2 "	33 68
1114 Welding the diesel of D7. 4180	1 No.	6 72
1115 Repairs to wheel and rims of rubbish cart.	1 cart.	125 24
1116 Repairs to circle jack traveller	1 No.	31 10

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. RP.
1117 Reconditioning the radiator of D7. 8078 ..	1 No.	182 10
1118 Reconditioning the belly plate of D7. 7052.	1 "	22 50
1119 Reconditioning track master pin	2 Nos.	9 96
1120 Boiler of DD. 2. repairs	1 No.	7 38
1121 Regular wire rope piece removed and 10" bits welded.	3 Nos.	75 24
1122 Removing the broken studs from the blower handle and providing one bolt.	1 No.	2 30
1123 Extract broken studs and cleaning the threads to 3" clutch valve.	1 "	2 40
1124 Cutting the 2" G.I. pipe and threading ..	1 "	5 50
1125 Welding the gate valve	1 "	2 47
1126 Planning the plank of tree on both sides ..	1 "	1 58
1127 Reconditioning water pump assembly and refitting complete assembly for lorry MSC 9638.	1 "	16 52
1128 10" old shoe welded into stip socket side and pieces also to be given.	1 "	31 12
1129 Repairs to G.M. Valve	2 Nos.	13 58
1130 Removing the broken stud from the P.C.U. cover of D7. 2491.	2 "	4 94
1131 Welding and shaping the clutch fingers ..	3 "	21 47
1132 Water pump fibre washer supplying ..	1 No.	3 80
1133 Rivetting the old brake band of P.C.U. of D7. 2491.	1 "	9 52
1134 Soldering the nipple to another pipe ..	2 Nos.	3 16
1135 Zinc pot leaks soldering and rivetting ..	3 "	8 58
1136 Repairs to rose can and sickles	6 "	9 98
1137 Zinc buckets leak repairs and providing bottom, etc.	3 "	15 40
1138 Mamaties :—Providing handle and other repairs.	8 "	21 58
1139 Crow bar :—Straightening and sharpening.	4 "	2 48
1140 Hammer :—Welding handles	1 No.	1 58
1141 Chair wrench :—Joining links	1 "	3 80
1142 Sectare sharpening	4 Nos.	1 58
1143 Screw driver :—Handle providing	1 No.	1 58
1144 Transplanting spade :—Providing handle ..	1 "	1 90
1145 Chisel (Carpenter) Providing handles and sharpening.	2 Nos.	7 94
1146 Pruning shears :—Providing Handles, bolts, nuts and sharpening.	7 "	19 50
1147 Cycle pump :—Providing handle and rubber connection.	1 No.	3 80
1148 Repairs to sprayer	1 "	24 40

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. RP.
1149 Fixing and setting the pedal and steering bushes to the assembly of D7. 3872.	1 assy.	40 56
1150 Providing and fitting up clutch yoke bushing.	2 Nos.	25 40
1151 Reconditioning sprocket wheel	4 ..	280 00
1152 Reconditioning idler wheel of D. 6	1 No.	116 00
1153 Providing one adaptor as per sample ..	1 ..	23 76
1154 Removing the old gear and refitting the gear.	1 ..	6 86
1155 Filing cork to be turned and rethreaded to suit the nut for oil engine.	1 ..	2 62
1156 Welding the cracked portion of the 3" foot valve.	1 ..	5 10
1157 Welding the broken portion of air cleaner.	1 ..	2 38
1158 Reconditioning the pitman pin of P.D. 9 ..	1 set.	14 45
1159 Jar welding D.D. 6	1 No.	19 53
1160 Track frame :—Reconditioning and welding broken diagonal brace holder.	2 Nos.	72 42
1161 Reconditioning the track roller with shaft.	3 ..	82 98
1162 Reconditioning track roller without shaft ..	2 ..	37 70
1163 Reconditioning track roller (S.F.) with shaft.	5 ..	121 28
1164 Reconditioning track roller (S.F.) without shaft.	1 No.	26 43
1165 Reconditioning track frame trunion ..	2 Nos.	28 82
1166 Reconditioning corner blades of D. 6 ..	6 ..	87 91
1167 Reconditioning water pump impeller of D.6.	1 No.	12 72
1168 Reconditioning hydraulic pump flange ..	1 ..	44 74
1169 Providing one adaptor as per sample ..	1 ..	19 56
1170 Providing fan bushes	2 Nos.	1 58
1171 Master bush cut as per sample	4 ..	2 47
1172 Strip plates welded at the sides of the strip.	1 No.	12 96
1173 Supplying 10" pin	1 ..	3 50
1174 Teapoy repairs	1 ..	11 02
1175 Providing 3" flange and 5/8" holes	8 Nos.	9 88
1176 Cutting and threading 2½" pipe	4 ..	27 50
1177 Cutting and threading 2" pipe	2 ..	8 96
1178 Welding the water hose of bus MDC 9718.	1 No.	5 38
1179 Threading 2" pipe	4 Nos.	5 50
1180 Reconditioning master bush of D7. 4180 ..	2 ..	3 80
1181 Repairs to cash box	1 No.	1 58
1182 Jack shaft spudding clutch bracket repairs.	1 ..	17 04
1183 Replacing water tank bottom of D.D. 6 ..	1 ..	68 32
1184 Equalizer spring leaf welding and grinding.	..	87

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. RP.
1185 Hatchet (Sharpening and providing handle (small).	2 Nos.	1 58
1186 Hatchet (big):—Sharpening and providing handle.	2 ..	3 93
1187 Mattack sharpening	1 No.	4 78
1188 Rake:—Providing handles and other repairs.	3 Nos.	7 09
1189 Cultivator :—Providing frongs and handles.	2 ..	11 88
1190 Civirature repairing	2 ..	3 32
1191 Hand fork :—Sharpening teeth	2 ..	3 16
1192 Pick axe :—Sharpening	1 No.	1 58
1193 Bill hook :—Sharpening and providing handles.	2 Nos.	1 58
1194 Plannet junior hoe :—Reconditioning and repairs.	1 No.	1 58
1195 Repairs to copper boiler	1 ..	49 46
1196 Reconditioning the master pin	1 ..	20 24
1197 Welding and turning the cage assembly of D7. 2491.	1 ..	19 46
1198 Slips handle extended	2 Nos.	7 40
1199 Making holes in chasis at workspot ..	2 Holes.	14 82
1200 Drilling the rivets in clutch facing and rivetting the same into another shaft.	1 No.	19 36
1201 Welding the bonnet of John deere tractor MSZ 165	1 ..	2 39
1202 Reconditioning and rethreading the wheel hub of john deere tractor.	1 ..	..
1203 Repairing the jar of D. 7	1 ..	37 19
1204 Reconditioning the 'L' bolt with nut ..	1 ..	1 58
1205 Repairs to Electrical sterilizer	1 ..	76 04
1206 Rubbish cart :—Renewal of yoke	1 ..	24 02
1207 Soldering the bellow seal of D7.	4 Nos.	29 76
1208 Cutting to size and grinding the master bush of D7. 3894.	3 ..	3 16
1209 Reconditioning master pin of D7. 3894 ..	4 ..	14 64
1210 Reconditioning corner blade of D7. 8078 ..	1 No.	45 88
1211 Reconditioning master pin of D7. 4180 ..	4 Nos.	41 56
1212 Reconditioning timing cover of lorry MSC 9581.	1 No.	5 24
1213 Weld and out the master bush of D7. 7052.	2 Nos.	4 97
1214 Reconditioning master pin collar of D7. 7052.	4 ..	3 56
1215 Reconditioning master pin of D7. 7052 ..	3 ..	11 44
1216 Removal of broken stud from the trummi shaft and rethreading, etc.	1 No.	2 37

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3) Rs. NP.
1217 Reconditioning centre blade of D7. 7126 ..	1 No.	226 08
1218 Soldering the float ball with rod	4 Nos.	2 71
1219 Soldering the air cleaner cup	1 No.	2 20
1220 Reconditioning the P.C.U. operating laver shaft.	1 ..	17 14
1221 Sharpening the pruning shears	2 Nos.	3 32
1222 Reconditioning test tube slant culture boxes.	2 ..	42 99
1223 Reconditioning master pin of D7. 3926 ..	4 ..	12 06
1224 Reconditioning the transmission oil filter of D7. 8078.	1 No.	32 42
1225 Providing allon screw for the clutch cage of D7. 8078.	2 Nos.	6 87
1226 Reconditioning the clutch pressure spring to clutch plate assembly.	3 sets.	16 52
1227 Providing fly wheel bolt lock	5 Nos.	22 08
1228 Clutch yoke lock of D7. 8078	2 ..	2 90
1229 Providing gear box shaft lock as per sample.	1 No.	4 68
1230 Reconditioning the crown shaft	1 set.	8 90
1231 Repairs to bracket handle	1 No.	23 60
1232 Washer as per sample for P.C.U. shaft for D7. 3872.	1 ..	3 16
1233 Draw bar end bending and drilling holes of 503 M.H. plough.	1 ..	5 32
1234 Repairs to stirrup pump	1 ..	4 48
1235 Repairs to autoclave	1 ..	37 04
1236 Refacing adjustment bolt of D7. 4180 ..	1 ..	4 48
1237 John deere tractor exhaust pipe welding ..	1 ..	3 88
1238 Providing sub-oil level plug of tractor ..	1 ..	5 24
1239 Reconditioning the tappet stud adjustment screw.	1 ..	5 02
1240 Cross foot repairs	1 ..	3 65
1241 Repairs to mechanical seed drill	1 ..	62 94
1242 Sharpening the chaff cutter blades	4 Nos.	3 16
1243 Repairs to cinder grating	1 No.	0 79
1244 Welding 2 3/8" pipe with the flange ..	1 ..	5 40
1245 Cutting and threading the 2 1/2" pipe ..	1 ..	28 22
1246 Reconditioning clutch lever pins of D7. 8078.	2 Nos.	3 16
1247 Cutting the length of the toe bar chains ..	2 ..	5 68
1248 Removing the 5" flange from the 5" pipe ..	1 No.	4 04
1249 Cutting the 5" pipe to a length of 3.5" ..	1 ..	11 30
1250 Repairs to hand gin	1 ..	14 30
1251 Reconditioning the dynamo body of jeep MDC 3362.	1 ..	2 48

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3) Rs. NP.
1252 Providing bushes for self starter	3 Nos.	8 23
1253 Rethreading filter union portions and providing union and threading.	2 ..	14 00
1254 Reconditioning corner blade of D7. 3872 ..	1 No.	37 82
1255 Extending one attachmant to Milling machine for grinding the planning machine blades.	1 ..	41 08
1256 2 1/2" G.I. pipe with 2 1/2" size coupling welding.	1 ..	14 14
1257 Welding the ladders in G.I. pipe	3 Nos.	1 90
1258 Making additional weight to the crankshaft grinder.	1 set.	20 00
1259 Cutting the length of pipes of threading ..	2 Nos.	1 90
1260 Welding the drum with 2" coupling ..	10 ..	7 00
1261 Reconditioning the front idler shaft of D7. 3872.	2 ..	103 92
1262 Reconditioning bell crank	4 ..	271 11
1263 Reconditioning front idler shaft of D7. 3894.	1 No.	47 7
1264 Grinding the W.6 crankshaft to '30 U.S.' ..	1 ..	65 19
1265 Cutting the old gas house sheet in 1 1/2" dia ..	..	142 19
1266 Reconditioning track roller shaft of D7 6298.	10 Nos.	372 00
1267 Threading 2 1/2" pipe on one side and welding the coupling on the other side.	24 ..	157 16
1268 Single bullock cart: Right side iron tyre refixed.	1 No.	8 11
1269 Reconditioning victory share ploughs ..	48 Nos.	171 14
1270 Mamaties:— Replacing handles and rings ..	20 ..	57 80
1271 Reconditioning front idler wheel	1 No.	93 44
1272 Body patch up work for bus MDC 9718 ..	1 ..	48 00
1273 Reconditioning corner blades of D7. 8078 ..	1 ..	32 16
1274 Reconditioning centre blade of D7. 3894 ..	1 ..	199 19
1275 Reconditioning corner blades of D7. 3894 ..	2 Nos.	54 14
1276 Welding the 12" pipe	1 No.	16 12
1277 Reconditioning centre blade of D7. 5822 ..	1 ..	161 95
1278 Repairs to iron gate	1 ..	28 48
1279 Reconditioning the silencer of jeep MSZ 5048.	1 ..	1 56
1280 Sharpening the 1/2" plate	3 Nos.	17 48
1281 Repairs to trampler	1 No.	35 28
1282 Repairs to puddler	1 ..	25 48
1283 Repairs to traingular harrow	1 set.	23 02
1284 Reconditioning the left adjustment liver of MC. deering No. 8.	1 ..	3 16

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
1285 Providing a handle and hole 5/16 depth adjustment handle.	1	1 90
1286 Rivetting brake liner in a band	1	8 96
1287 Threading P.C.U. cover	1	3 16
1288 Reconditioning the roller frame	2	180 94
1289 Rethreading the track roller strip	8	39 20
1290 Reconditioning the track rollers of D7. 7126.	10	161 64
1291 Reconditioning the carrier roller shaft of D7. 3872.	2	8 96
1292 Reconditioning the master bush	2	0 95
1293 Jin roller groove cutting	1	21 60
1294 Refacing bolt head as per sample	18	10 48
1295 Welding victory plough share point	1	14 58
1296 Rod retainer of jack hammer repairs	1	14 56
1297 Repairs to jack hammer air control valve	1	14 39
1298 Repairs to pruning scissors	3	26 14
1299 Rivetting the brake lining	1	17 26
1300 Soldering the funnel of D7. 3894	1	3 82
1301 Repairs to roberston road gate	1	16 64
1302 Welding the 4½" D.V. boiler	1	8 96
1303 Sector shaft twined and suit bushes on either side of the steering box of jeep MSZ 4203.	1 set.	5 24
1304 Steering worn shaft check bend and rethread the shaft for jeep MSZ 4203.	1	15 64
1305 Bell crank arms ball welding and turned for jeep MSZ 4203.	4	14 04
1306 Making key way to bearing set shaft	1	11 02
1307 Plough spring repairs of J.D. tractor MDC 5879.	1	1 90
1308 Repairs to south bend lathe	1	4 56
1309 Repairs to water baths	1	6 00
1310 Modifications in cylinder boring machine.	1	130 00
1311 Reducing the height of the luggage carrier of bus MDE 3413.	1 set.	58 11
1312 Welding the leaky barrels	10	10 44
1313 Repairs to seed dressing drum	1	36 07
1314 Repairs to push cart	1	166 60
1315 Repairs to foot pump	1	2 50
1316 Repairs to drilling jar	3	37 90
1317 Supply of dowel pin as per sample for steering engine clutch of D7-4180.	1	3 16
1318 Removing the recoil spring bolt and nut for D7-4180.	2	7 94

APPENDIX No. 21—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars. (1)	Quantity. (2)	Amount. (3) RS. NP.
1319 Welding the corner blades of D7-3926 ..	2	57 20
1320 Welding and reconditioning P.C.U. corner of D7-3926.	1	4 42
1321 Grinding the D7 crankshaft to 50 U.S. ..	1	943 21
1322 Reconditioning the bowel glass assembly pipe and union.	1 set.	13 00
1323 Fixing the laboratory basins at Freeman buildings.	12	98 00
1324 Truing pulley, boaring a hole, turning a shaft, turning a roller and boaring a gear.	5	38 01
1325 Cutting and threading of 4 lengths of pipe and making 6" nipple.	8 threads nipple.	24 15
1326 Repairs to keeton sheet cutter	1	22 52
1327 Welding the petrol tank of jeep MSZ 4203.	1	3 01
1328 Repairs to air compressor engine radiator and coil cooler.	1	124 16
1329 Reconditioning track master pin of D7-2491	4	16 82
1330 Repairs to wooden tool box	2	62 20
1331 Reconditioning the batter box	1	5 80
1332 Almiera and other furniture repairs ..	1 almira and other furniture.	75 80
1333 Drilling holes in roller bushing	16	3 16
1334 Repairs to plough chain	1	71 96
1335 Making oil cup and brazing with the collar of starting engine.	2	4 26
1336 Welding the gear box of D7-8078	1	20 00
1337 Reconditioning the master pin of D7-5822..	2	22 48
1338 Reconditioning the front idler wheel of D7-7126.	2	130 74
1339 Refacing the recoil spring adjustment bolt.	1	1 58
1340 Welding and filing the track adjustment bracket of D7-7126.	1	3 64
1341 Welding the carrier roller of D7-7126 ..	4	46 24
1342 Master bush reconditioning	—	1 90
1343 Reconditioning the master pin of D7 3822.	2	18 70
1344 Welding the leaky barrels	5	2 74
1345 Reconditioning the gear box main shaft and making key way, etc.	1	11 63
1346 Welding the hood pipe of D7 7052	1	2 47
1347 Reconditioning the corner blades of D7-4978.	2	24 16
1348 Welding the mudguard of bus MDC 9718 ..	1	4 24
1349 Reconditioning the master pin of D7-4180..	2	3 80
1350 Providing locking arrangements for cutting 44 gln barrels lid.	3	17 52
1351 Brasing the fuel line of D7 3894	1	2 16

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
1352 Reconditioning the main spring plate leaves	2	15 30
1353 Reconditioning the corner blades of D4 ..	13	106 04
1354 Reconditioning the track roller frame D4..	2	57 74
1355 Reconditioning the master pin of D7 3894..	2	10 06
1356 Gin pulley board and bush inserted to suit shaft for the ginning machine.	1	16 96
1357 Repairs to the air control valve of jack hammer.	1	4 48
1358 Reconditioning front idler wheel of D7 7126	1	108 70
1359 Repairs to the radiator of jeep MDC 8501..	1	14 00
1360 Reconditioning the hood rod (welding and drilling holes).	1	3 80
1361 Reconditioning the master pin of D7 8078..	2	20 20
1362 Reconditioning the corner blades of D7 5822	2	30 70
1363 Repairs to die	1	10 54
1364 Flat valve and dart valve repairs .. .	2	34 90
1365 Reconditioning hydraulic press cylinder ..	1	8 59
1366 Repairs to hand saw handles and sharpening.	2	14 62
1367 Repairs to fork	1	1 90
1368 Repairs to mamaties handles	10	34 68
1369 Repairs to the bill hook	1	1 90
1370 Threading the 2" pipe.. .. .	2	1 90
1371 Reconditioning front idler wheel of D7 3926	1	108 94
1372 Repairs to lawn mover	1	4 48
1373 Repairs to gate valve	1	4 74
1374 Repairs to 14 monkey spanner	1	3 80
1375 Repairs to oil collar of D4	1	21 00
1376 Reconditioning front idler wheel of D7 3894	1	115 00
1377 Reconditioning master pin of D7 3926 ..	2	6 99
1378 Reconditioning corner blades of D7 5822 ..	2	46 62
1379 Diesel tank filter providing brass netting and soldering.	1	15 00
1380 Washer removal etc.	1	2 40
1381 Repairs to water cart.. .. .	1	21 52
1382 Repairs to double bullock cart	1	4 48
1383 Repairs to radiator lorry MSY 2419 ..	1	10 00
1384 Removing the segment and pressure spring leaf from one assembly and refitting the same to another assy. in clutch disc. of DJ 3894.	1	23 76
1385 Reconditioning master pin of D7 3926 ..	2	13 92
1386 Reconditioning master pin of D7 2491 ..	2	12 07

APPENDIX 22—cont.

List of reconditioned articles at the Tractor Workshop, Coimbatore, for the year ending from 1st July 1960 to 30th June 1961—cont.

Serial number and particulars.	Quantity.	Amount.
(1)	(2)	(3)
		RS. NP.
1387 Reconditioning the master bush of D7 8078	2	1 58
1388 Reconditioning the clutch yoke lever of D7 3894.	1	1 90
1389 Cutting the 2½" G.I. pipe for a length of 10" and rethreading.	2	2 62
1390 Reconditioning and welding circle jack and making teeth etc.	1	344 77
1391 Welding the crank case of D4	4	510 00
1392 Grinding the D7 crankshaft to 50 U.S. ..	1	152 58
1393 Providing bolts for the shaft of D7 3894 ..	2	3 80
1394 Extending the attachment to milling machine for grinding the lanning machine.	1	30 00
1395 Welding the ladders in G.I. pipe	3	46 98
1396 Tool box repairs	1	92 40
Total ..		49,582 46

APPENDIX 23.

Statement showing the particulars of servicing carried out at the Tractor Workshops, Coimbatore, during the year from 1st July 1960 to 30th June 1961.

Serial number and vehicle number.	Particulars of repairs done.
(1)	(2)
	Lorries.
1 MSC 9626 ..	Repairing the mudguard silencer and rectifying trouble in electric system. grinding valves.
2 MSC 9594 ..	Tuning up engine. Checking electrical system.
3 MSC 9581 ..	Repairs to water pump.
4 MSC 9551 ..	Minor repairs, welding the back mudguard.
5 MSC 9638 ..	Replacing self starter switch. Minor repairs.
6 MSC 9547 ..	Radiator repairs. Silencer repairs.
7 MSC 9616 ..	Estimate for major overhaul has been sent to Director of Agriculture, Madras for sanction
8 MSC 9551 ..	Painting, overhauling the engine, patch up work before brake inspection.
9 MSC 9581 ..	Rectifying the defects in the inlet manifold.
10 MSC 9612 ..	Repairs to king pin assembly, checking the head light striching covers for two seats.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number and vehicle number.	Particulars of repairs done.
(1)	(2)
	<i>Lorries—cont.</i>
11 MSZ 2419 ..	Replacing carburator parts, decarbonizing engine, Renewing king pin bushes, adjusting tie rod ends, checking brake system, servicing the radiator, providing zinc sheets for the platform checking universal joints and other minor repairs.
12 MSC 9594 ..	Overhauling engine and brake system.
13 MSZ 2419 ..	Attending to the repairs of the dynamo.
14 MSC 9551 ..	Removing broken studs from the rear wheel drums and fixing new studs.
15 MSC 9551 ..	(1) Attending minor repairs. (2) Attending brake system. (3) Tuning up the engine
16 MSZ 2419 ..	Attending to starting troubles.
17 MSC 9594 ..	(1) Engine tune up. (2) Checking up of propeller shaft and its joints.
18 MSZ 2419 ..	Refacing the valves of the lorry (exhaust and inlet 12 numbers)..
19 MSC 9551 ..	(1) Repairs to Dynamo. (2) Reconditioning radiator.
20 MSC 9551 ..	(1) Overhauling the self starter. (2) Changing pinion oil seal.
21 MSC 9551 ..	(1) Changing speedometer inner cable. (2) Overhauling dynamo. (3) Changing of new spark plugs. (4) Changing of high tension leads. (5) Checking of valves. (6) Reconditioning hand brake, etc.
22 MSC 9551 ..	Repairing the Self starter.
23 MSC 9551 ..	Reconditioning the seats (Two pairs) of the lorry.
24 MSC 9583 ..	(1) Repairs to brake system complete. (2) Renewal of king pin kit.
25 MSC 9583 ..	(1) Cleaning carburator. (2) Servicing Dynamo. (3) Adjusting cut out. (4) Welding the body. (5) Checking light connections. (6) Renewing accelerator spring. (7) Crank case packing renewing.
26 MSC 9612 ..	Soldering the radiator of the lorry.
27 MSC 9581 ..	Attending to the brake down of the lorry at Karumathampatti.
28 MSC 9581 ..	(1) Replacing carshaft gear, Timing oil seal and engine mount front. (2) Minor repairs.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number and Lorry number.	Nature of repairs done.
(1)	(2)
	<i>Lorries—cont.</i>
29 MSC 9551 ..	(1) Dismantling the rear spring. (2) Replacing the broken main leaf with a new one.
30 MSC 9612 ..	(1) Examining the lines, crank shaft and bearing. (2) Preparation of estimate.
31 MSC 9638 ..	Charging the 6 volts battery.
32 MSC 9551 ..	Servicing the lorry.
33 MSC 9551 ..	(1) Examining the engine, etc. (2) Preparation of estimate. (3) Changing the clutch disc. (4) Servicing the engine. (5) Engine tune up. (6) Other minor repairs.
34 MSC 9638 ..	Preparation of estimate by examining the lorry for brake inspection.
	<i>Jeeps.</i>
35 MDE 3362 ..	Rectifying defects in self starter.
36 MDC 8501 ..	Repairing radiator. Painting hood and welding the rear sheet.
37 MSZ 5048 ..	Checked left wheel bearing. Checked brake lining of all the wheels and adjusted brakes. Rectified leak in radiator. Bracket provided in Stepney wheel. Repairs to radiator and renewal of bottom hose and main cable.
38 MDE 729 ..	Tuning up engine. Stopping oil leak in right front wheel.
39 MDC 7879 ..	Checked leak in rear left wheel. Removing belt in the 'U' clamp of the rear spring adjusting the clutch, checking the dynamo for noise.
40 MDC 8350 ..	Major overhauling.
41 MDC 8501 ..	Repairs to self starter. Brakes and wheels starpoints, changing carburator unit, repairing and checking clutch assembly steering assembly.
42 MSZ 4203 ..	Overhauled the differential.
43 MDE 1231 ..	Tuning up engine; carburator cleaning, horn bracket replacing, checking up tie and steering rods, rectifying in dynamo.
44 MDC 7879 ..	Carburator cleaning, valve adjusting, checking plugs and platform.
45 MSZ 5048 ..	Repairing the radiator, checking the valves and adjusting front left wheel for shake.
46 MDJ 2209 ..	Renewal of gear box oil seal and welding the rear seat.
47 MDC 8501 ..	(1) Tuning the engine. (2) Repairs to clutch. (3) General check up.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial Number and jeep number.	Nature of repairs done.
(1)	(2)
	<i>Jeep—cont.</i>
48 MDC 9594 ..	Major overhauling.
49 MDC 8501 ..	(1) Dismantling the engine. (2) Examining the engine. (3) Preparation of estimate.
50 MDC 1231 ..	Changing of pinion oil seal.
51 MDE 1231 ..	(1) Changing A. C. pump kit. (2) Cleaning of petrol tank.
52 MDC 9594 ..	(1) Repairs to clutch. (2) Testing fuel line.
53 MSZ 4203 ..	(1) Tuning up the engine. (2) Cleaning the petrol tank.
54 MDE 1231 ..	(1) Adjustment of valves. (2) Adjustment of brakes.
55 MDE 1231 ..	(1) Replacing of brake lines. (2) Overhauling the brakes. (3) Fixing side indicators.
56 MSZ 5048 ..	(1) Welding the right and left mudguards. (2) Reconditioning of top (hood). (3) Fitting up one back seat.
57 MDE 1231 ..	(1) Repairing leakage in radiator. (2) Engine tune up.
58 MDC 8501 ..	Overhauling the engine as per estimate.
59 MDC 9594 ..	Painting the jeep.
60 MDC 8501 ..	Fitting one set of electric horn.
61 MSZ 5048 ..	(1) Testing the radiator and reconditioning the same. (2) Periodical check up.
62 MDC 9594 ..	(1) Leak in the gear box. (2) Self starter trouble. (3) Wheel wobbling. (4) Rewind winch.
63 MDC 7879 ..	(1) Replacing carburettor kit. (2) Replacing universal journal. (3) Replacing contact braker set. (4) Replacing silencer and its extension.
64 MSZ 5048 ..	(1) Fixing new radiator core. (2) Minor repairs.
65 MSZ 5048 ..	(1) Preparation of estimate after checking clutch assembly. (2) Executing of work.
66 MDC 8501 ..	(1) Replacing water pump. (2) Engine tune up.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number.	Nature of repairs done.
(1)	(2)
	<i>Jeeps—cont.</i>
67 MDC 3362 ..	(1) Testing the vehicle. (2) Executing the repairs. (3) Minor repairs.
68 MDC 8501 ..	(1) Cylinder head gasket renewing. (2) Engine tune up.
69 MDC 8501 ..	(1) Examining the jeep's engine. (2) Preparation of estimate.
70 MDC 3362 ..	(1) Replacing clutch assembly. (2) Renewal of bell crank assembly. (3) Servicing dynamo. (4) Servicing self starter. (5) Engine tune up. (6) Changing gear box oil seal. (7) Changing the spark plugs. (8) Changing the propeller shaft. (9) Minor repairs.
71 MDC 8501 ..	(1) Valve grinding and seating. (2) Putting expander to the piston rings. (3) Engine tune up.
72 MDC 9594 ..	Charging the 6 Volt battery.
73 MSZ 5048 ..	Preparation of estimate by examining the vehicle.
74 MDC 8501 ..	(1) Checking and repairing clutch assembly. (2) Servicing Dynamo.
75 MSZ 5048 ..	(1) Overhauling of brake system. (2) Changing front axle seal. (3) Changing front axle pinion seal. (4) Replacing brake hose rear. (5) Engine tune up. (6) Other minor repairs.
76 MDC 8501 ..	Servicing the Jeep.
77 MDE 1231 ..	Adjustment of the brake system of the vehicle.
78 MDC 8501 ..	(1) Preparation of estimate by examining the Jeep.
79 MDC 8501 ..	(1) Removing the radiator and soldering the same. (2) Attending to horn wire connections. (3) Assembling the radiator to the engine.
80 MSZ 4203 ..	Preparation of estimate by examining the engine, etc., of the Jeep.
81 MSZ 4203 ..	(1) Attending to steering system. (2) Overhauling brake system. (3) Adjustment of clutch. (4) Changing rear shock absorbers. (5) Changing wheel cylinder kit complete. (6) Changing 'U' clamps.
82 MSZ 5048 ..	Servicing of the Jeep.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number.	Nature of repairs done.	
(1)	(2)	
	<i>Bus</i>	
83 MDC 9718	Adjusting steering, checking the brakes setting, the right rotting. Renewing the hand brake lining. Overhauled the distributor unit, Checked the ignition system. Overhauled the carburettor and tune up engine.	
84 MDC 9718	.. Setting right the defects in the ignition system.	
85 MDC 9718	.. (1) Attending to the leakage of oil in the steering assembly. (2) Welding the crack in the dash board of the bus.	
86 MDC 9718	.. (1) Overhauling of self starter. (2) General check up.	
87 MDC 9718	.. Preparation of estimates after examining the vehicle.	
88 MDC 9718	.. (1) Reconditioning dents in the body. (2) Body rotting. (3) Replacing radiator core. (4) Leakage in steering and gear box. (5) Providing ignition key with switch. (6) Painting the body wherever it is necessary.	
89 MDE 3413	.. (1) Reconditioning the luggage carrier of the bus, by reducing the height of the carrier (Under this work order one the estimate was prepared and the actual work will be taken up in a separate work order after approval of estimate.)	
90 MDC 9718	.. Servicing the bus MDC 9718.	
91 MDE 3413	.. Reconditioning the luggage carrier of the bus MDE 3413 as per estimate.	
92 MDE 3413	.. (1) Adjustment of brakes. (2) Rectifying the defects in the switch line. (3) Engine tune up. (4) Front wheel alignment.	
	<i>Van</i>	
93 MSY 3808	.. Providing cover for luggage carrier. Overhauling the Brakes, setting the right gear slip. Setting right the ventilation glass in the back door, general check up of the engine.	
94 MSY 3808	.. Rectifying defects in the inlet manifold and overhaul gear loose. Tuned the engine. Replacing silencer muffler. Overhauling the fuel and ignition system. Checking up braked engine.	
95 MSY 3808	.. Checking the speedometer connection.	
96 MSY 3808	.. (1) Engine tune up. (2) Set right the electric horn.	
97 MSY 3808	.. General check up of the engine.	
98 MSY 3808	.. (1) Engine decarbonizing. (2) Attending suspension. (3) Attending king pin. (4) Brake overhauling, etc.	

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number.	Nature of repairs done.	
(1)	(2)	
	<i>Van—cont.</i>	
99 MSY 3808	.. Preparation of estimate as per the endorsement of the Assistant Agricultural Engineer, Tractor workshop, Coimbatore,	
100 MDC 1103	.. (1) Servicing the van. (2) Soldering the radiator. (3) Charging the battery. (4) Reconditioning the side door lock. (5) Sticking the hood.	
101 Land Rover MSZ 2687.	Examining the clutch assembly.	
102 MDO 1103	.. (1) Servicing the van. (2) Cleaning the A.C. Pump and cleaning washer. (3) Cleaning the petrol tank. (4) Charging the battery.	
103 MSY 3808	.. Preparation of estimate by examining the vehicle.	
104 MSY 3808	.. (1) Adjusting the brakes. (2) Replacing the silencer extension pipe with a new one. (3) Changing the condensor. (4) Engine tune up.	
105 MDO 1103	.. Servicing the vehicle.	
106 MDO 1103	.. (1) Cleaning the carburettor. (2) Attending to wire connection of head light. (3) Fixing weldlock bolts and nuts,	
107 MSX 5851	.. (1) Cleaning the carburettor. (2) Setting right the defects.	
	<i>Tractors.</i>	
108 Formal tractor. 'A'	Replaced the differential housing.	
109 John Deere Tractor MDC 7879.	Rectifying starting trouble, providing bush for the clutch lever.	
110 Massey Ferguson Tractor F.E. 35.	Checking the stay and bracket of the hydraulic lift arrange for broken studs and rectifying,	
111 John Deere 'A' Tractor.	Grinding valves, renewed spark plugs, stoping leakage in radiator, providing oil seal remetalling the connecting rods, renewed piston rings and repairs to seat.	
112 Formal Tractor MDC 9218.	Repairing the self starter and changing the batteries.	
113 20 K.M.H. Tractor.	Repairing the dynamo.	
114 John Deere Tractor.	Repairs to silencer.	
115 Tractor W. 6. MDC 6775.	Testing the spark plugs.	

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number.	Particulars of repairs done.	
(1)	(2)	
	<i>Tractors—cont.</i>	
116	Tractor 20 (K) MDC 4517.	(1) Examining the tractor. (2) Preparing Estimate.
117	M.H. Tractor MDC 4517.	(1) Engine tune up. (2) General repairs.
118	John Deere MDC 5879.	Reconditioning the hose pipe.
119	John Deere MDC 5879.	(1) Attending oil leak. (2) Minor repairs. (3) Adjusting brake system.
120	Formal MDC 8349 tractor.	Preparing of estimates by examining the tractor.
121	John Deere Tractor MDC 5879.	(1) Setting right back wheel hub. (2) Minor repairs.
122	John Deere MDC 5879.	(1) Setting right the back wheel hub and reconditioning the same. (2) Minor repairs.
123	Massey Harris Tractor.	Attending to starting troubles of the tractor.
124	John Deere MDC 5879.	Inspecting the vehicle at site and rectifying the defects.
	<i>Other Machineries.</i>	
125	Sprayer	General repairs to the sprayer.
126	Pumpset in Well No. 63.	Putting threads to the pipe.
127	Turbine pipe in Well No. 42.	Dismantling the entire pump.
128	R. N. Engine ..	Repairs to the Engine.
129	Electric Motor ..	General repairs to electric motor and pumpset.
130	Electric Motor pump in well No. 76.	General repairs to pumpset.
131	Pumpset in New area well.	Repairing the pumpset and electric motor.
132	Batteries ..	Charging the batteries.
133	Electric motor and pumpset in well No. 50.	Repairing the motor and pumpset.
134	Pump in well No. 68.	Repairing the pump.
135	Electric motor and pumpset.	Repairs to motor and pumpset.
136	Motor and pumpset of well No. 60.	Erecting assembled motor and pump and providing wooden bud.
137	Centrifugal pump in well No. 50.	Repair to the centrifugal pumps.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number.	Particulars of repairs done.	
(1)	(2)	
	<i>Other Machineries—cont.</i>	
138	'A' Block pump-set.	Repairing the foot valve.
139	Wet lands ..	Attending the repairs to the motor of the pumpset in 'M' block.
140	Well No. 68 ..	Repairing the pump.
141	Well No. 68 ..	Repairing the motor.
142	Power sprayer ..	Repairing the power sprayer.
143	Well No. 68 pump and motor.	Changing the pump and motor to some other place.
144	Well No. 77 ..	1. Installing 77 well pump in well No. 77 of Central Farm. 2. Manufacturing grease cup. 3. Manufacturing air valves.
145	Well No. 68 ..	Repairing the motor and pumpset.
146	Drill D. D. 6. Studebaker truck.	Setting right brake system complete.
147	Cylinder heads of R. B. U. II. Darman.	Seating of valves to cylinder head of Darman engine.
148	Wolf valve refacer.	Replacing the armature to the above.
149	A. V. Petter ..	Examining the injectors of A.V. II petter and do the needful.
150	50 Well motor ..	Replacing the gland packing of 50 well motor of western block.
151	D4. cylinder head	Reconditioning the D4. cylinder head by cutting and inserting sleeves and cutting valves, seats, etc.
152	Well No. 40 ..	Repairing the pumps of well No. 40.
153	Hydraulic Press.	Repairing the Hydraulic Press.
154	Cream separator.	Repairing the cream separator.
155	New area well ..	Repairing the pump.
156	Electric motor and pumpset.	Fitting the electric motor and pumpset in a new bed.
157	New area well ..	Repairing the 7.5 H.P. P.S.G. motor.
158	P. S. G. Motor ..	Cleaning the motor.
159	Carburettor ..	1. Reconditioning the air passage. 2. Cleaning the threads of air screw.
160	Power duster ..	1. Repairing the engine. 2. Other required adjustments.
161	Ceiling fan. ..	Fitting new bearings to the fan.
162	Pulley and base plate.	1. Reconditioning the old pulley to suit 7.5 H.P. motor.
163	Foot valve ..	Reconditioning the foot valve.
164	Batteries ..	Charging the 'AMCO' batteries.

APPENDIX 23—cont.

Statement showing the particulars of servicing carried out at the Tractor Workshop, Coimbatore, during the year from 1st July 1960 to 30th June 1961—cont.

Serial number.	Particulars of repairs done.	
(1)	(2)	
	<i>Other Machineries—cont.</i>	
165	Track chain ..	Servicing D.6. caterpillar chain (1 set).
166	Well No. 50	Fitting up 10 H.P. motor in the place of 7.5 H.P. to the well.
167	Table fan. ..	Reconditioning the table fan.
168	Service press ..	1. Examining the press. 2. Executing the work.
169	Track chain ..	1. Servicing the track chains, 2 Nos. 2. Preparation of estimate. 3. Dismantling the grouser plates, track pins, links and broken bushes.
170	'AMCO' Battery.	Charging the batteries, 2 Nos.
171	Hydro inflator ..	Providing one adopter and one nipple.
172	Batteries 'AMCO'	Charging the batteries, 2 Nos.
173	'AMCO' Batteries	Charging the batteries, 6 volts, 2 Nos.
174	Batteries ..	Charging the 6 volts 'AMCO' batteries, 3 Nos.
175	'J' block well-wet lands.	1. Manufacturing and supplying of sliding rails as per measurements. 2. Supplying one 5" G.I. coupling. 3. Supplying one 5" G.I. pipe of length 3'-5" threaded both ends.
176	'AMCO' batteries	Charging the 6 volts batteries belongs to D.D. 10.
177	'M' block ..	1. Overhauling the oil engine of the above block. 2. Preparation of estimate only.
178	'J' block well ..	Installing the oil engine in the new bed.
179	Well No. 77 ..	Preparation of estimate by examining the motor and pumpset of the well.
180	Batteries ..	Charging the 'AMCO' batteries, 6 volts, 2 Nos.
181	Valves ..	Refacing of 8 valves of D7. tractor 7126.
182	'J' Block ..	Preparation of estimate by examining the oil engine of the above block for overhauling.
183	Foot valve ..	Preparation of estimate for repairing the 'J' block foot valve and setting right at site.
184	Valves ..	Refacing D7. valves (exhaust valves 4 Nos.)
185	New area ..	Fitting up pipes and flanges in the newly erected motor and pumpset.
186	Batteries ..	Charging batteries 6 volts, 2 Nos. of D.D. 7. drill.

APPENDIX 24.

List of work orders completed during the year from 1st July 1960 to 30th June 1961.

Serial number and work order number.	Particulars.	Authority.	Amount.
(1)	(2)	(3)	(4)
1 G. 44/1960-61/1st July 1960.	Well No. 76—Repairing the pump ..	Farm Manager, Eastern Block. Central Farm, Coimbatore-3.	39 74
2 G. 45/1960-61/1st July 1960.	Repairing the sprayer ..	Farm Manager, Western Block. Central Farm, Coimbatore.	20 24
3 G. 46/1960-61/4th July 1960.	D. 4. cylinder head—Reconditioning the cylinder head of D4. tractor.	Assistant Agricultural Engineer, Coimbatore for Agricultural Engineering Supervisor (Tractors), Ootacamund.	38 00
4 G. 47/1960-61/4th July 1960.	MSY 3808 Vanguard—(1) Setting right the gear slip. (2) Setting right the lubrication of glass in the left back door. (3) General check up of the engine.	Assistant Agricultural Engineer, (Mechanical), Agricultural College and Research Institute, Coimbatore.	28 36
5 G. 48/1960-61/8th July 1960.	Lorry MSC 9547—(1) Radiator repair. (2) Silencer repair.	Assistant Agricultural Engineer (Inspection), Tiruchirappalli.	26 64
6 G. 49/1960-61/14th July 1960.	MSC 9616 Lorry—Repairs before brake inspection.	Assistant Agricultural Engineer Tractor Workshop, Coimbatore.	55 42
7 G. 50/1960-61/14th July 1960.	20 K. Massey Harris Tractor—(1) Repairs to Dynamo. (2) Rectifying starting troubles. (3) Charged the battery (4) Minor Repairs.	Superintendent, Central Farm, Coimbatore.	238 88
8 G. 51/1960-61/15th July 1960.	Farmal A Tractor—Replace differential housing (Part supplied by party).	Director, Sugarcane Breeding Station, Coimbatore.	58 54
9 G. 52/1960-61/15th July 1960.	New area well—Repairs to pumpset and engine. ..	Farm Manager, Eastern Block, Central Farm, Coimbatore.	427 91
10 G. 62/1960-61/17th August 1960.	Jeep MSZ 5048—(1) Check and rectify wobbling of the front left wheel. (2) Renew radiator bottom house. (3) Renew earth and main terminals.	Superintendent, Agricultural Research Station, Bhavaninagar.	22 02

APPENDIX 24—
List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number, work order number and date. (1)	Particulars. (2)	Authority. (3)	Amount. (4) Rs. and p.
11 G. 54/1960-61/18th July 1960.	DD10. Batteries 6 volts—Charged the batteries 2 Nos.	Assistant Agricultural Engineer (Inspection), Coimbatore (Drilling).	6 00
12 G. 55/1960-61/ 19th July 1960.	Electric motor at well No. 40—Repairs to electric motor and pumpset.	Farm Manager, Western Block, Central Farm, Coimbatore.	404 86
13 G. 57/1960-61/27th July 1960.	Repairs to electric motor	Do.	99 89
14 G. 58/1960-61/27th July 1960.	Repairs to electric motor and pumpset	Farm Manager, Eastern Block, Central Farm, Coimbatore	465 98
15 G. 59/1960-61/1st August 1960.	R. N. Oil engine—Repairs and renewals to R. N. Engine.	Do.	14 93
16 G. 60/1960-61/4th August 1960.	John Deere 'A' tractor MDC 5879—(1) Grind the valves. (2) Renew spark plugs. (3) Stop leakage in radiator. (4) Provide a oil seal. (5) Remetal the connecting rods. (6) Other minor repairs attended.	Superintendent, Central Farm, Coimbatore.	1,561 64
17 G. 61/1960-61/4th August 1960.	Sprayer—Repairs to sprayer	Do.	34 12
18 G. 53/1960-61/18th July 1960.	Jeep MSZ 5043—(1) Left front wheel bearing. (2) Check brake lining of all the wheels and adjusted. (3) Radiator checked. (4) Rectify leaking. (5) Stopney provided with a bracket.	Superintendent, Agricultural Research Station, Bhavanisagar.	42 51
19 G. 63/1960-61/13th August 1960.	MSC 9638 Lorry—Replaces water pump repair kit and minor repairs.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	76 60
20 G. 64/1960-61/16th August 1960.	MSC 9551 Lorry—Weld the back mudguard of lorry MSC 9551.	Do.	21 31
21 G. 65/1960-61/18th August 1960.	Well No. 50—Repair electric motor and pumpset ..	Farm Manager, Western Block, Central Farm, Coimbatore.	38 45
22 G. 66/1960-61/19th August 1960.	MDC 9594 Jeep—Repair and adjust the brake. Check and Repair self starter.	Agricultural Chemist and Associate Professor of Soil Science, Coimbatore.	64 56
23 G. 67/1960-61/25th August 1960.	Jeep MSY 4808—Rectifying starting trouble ..	Assistant Agricultural Engineer (Mechanical), Coimbatore.	10 02
24 G. 69/60-61/25th August 1960.	D7. 3926 Tractor—Painting to D7 tractor 4T. 3926.	Assistant Agricultural Engineer (Inspection), Coimbatore.	26 06
25 G. 68/60-61/23rd August 1960.	Jeep MDE 729—Tune up engine	Field Manure Officer, Coimbatore.	9 64
26 G. 70/60-61/27th August 1960.	MSC 9638 Lorry—(1) Replace three way union. (2) Check and rectify defects in self starter switch.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	45 34
27 G. 71/60-61/29th August 1960.	W. 6. Tractor MDC 6776—(1) Repairs to tractor. (2) Adjust steering. (3) Tune up engine. (4) Adjust and overhaul brakes	Superintendent, Agricultural Research Station, Bhavanisagar.	321 20
28 G. 72/60-61/2nd September 1960.	Putting threads to the pipes of well No. 68 and attending to the repairs.	Farm Manager, Central Farm, Coimbatore.	96 38
29 G. 74/60-61/6th September 1960.	Jeep MDC 7879—(1) Check brake in rear left wheel. (2) Remove bed in the 'U' clamp of the rear right spring. (3) Adjust clutch. (4) Check dynamo for noise.	Soil Survey Officer, Agricultural College and Research Institute, Coimbatore-3.	33 29
30 G. 75/60-61/7th September 1960.	Van MSY 3803—(1) Over haul brakes. (2) General check up of engine. (3) Providing a cover to the luggage carrier.	Assistant Agricultural Engineer, (Mechanical), Coimbatore.	336 08
31 G. 76/60-61/9th September 1960.	Sprayer—Repairs to sprayer	Senior Farm Manager, Central Farm, Coimbatore.	57 51
32 G. 77/60-61/14th September 1960.	Massey forguison tractor F.E. 35—Check the stay bracket of the hydraulic lift arrangement for broken studs and rectify defects.	Director, Sugarcane Breeding Institute, Coimbatore.	27 68
33 G. 78/60-61/14th September 1960.	Lorry MSC 9626—(1) Repairs mudguard. (2) Repair silencer. (3) Rectify troubles in electrical system.	Assistant Agricultural Engineer, M.B. Shed, Madras-15.	144 10
34 G. 79/60-61/14th September 1960.	Lorry MSC 9594—(1) Tune up engine. (2) Check electrical system.	Assistant Agricultural Engineer, (Research), Coimbatore.	11 00
35 G. 80/60-61/15th September 1960.	Van MDC 9616—To dismantle the engine and other parts and furnish estimation.	Assistant Agricultural Engineer, Sub Assis and Training Scheme, Coimbatore.	143 31

APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number- work order and date.	Particulars.	Authority.	Amount.
(1)	(2)	(3)	(4)
36 G. 81/60-61/15th September 1960.	Jeep MDC 8501—(1) Repair radiator. (2) Paint hood (spray). (3) Weld the rear sheet.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	Rs. Rs. 48 74
37 G. 87/60-61/17th September 1960.	Well No. 68—Repairs to electric motor and pump-set.	Farm Manager, Central Farm, Coimbatore.	44 26
38 G. 84/60-61/19th September 1960.	MSC 9581—(1) Repair water pump. (2) Check dynamo.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore-3.	172 95
39 G. 85/60-61/21st September 1960.	MDE 729—(1) Stop oil leakage in right front wheel.	Field Manure Officer, Coimbatore.	6 25
40 G. 86/60-61/22nd September 1960.	Turbine pump in P. No. 42. Dismantle pump and furnish list of spares.	Farm Manager, Western Block, Central Farm, Coimbatore.	57 22
41 G. 87/60-61/22nd September 1960.	S.S.F. Veerakeralam—(1) Repairs to pump set. (2) Repairs to gate valve. (3) Rethread the pipe line.	Farm Manager, State Seed Farm, Veerakeralam.	272 16
42 G. 88/60-61/23rd September 1960.	Jeep MDE 729—Renew oil seal in front right wheel.	Field Manure Officer, Agricultural College and Research Institute, Coimbatore-3.	21 28
43 G. 89/60-61/26th September 1960.	Jeep MDC 3362—Rectify defects in self starter ..	District Agricultural Officer, Erode.	12 35
44 G. 9/60-61/1st October 1960.	Jeep MDE 1231—(1) Tune up engine. (2) Carburetor cleaning. (3) Horn bracket replacing. (4) Checking of tyre and steering rods.	District Agricultural Officer, Coimbatore.	28 16
45 G. 91/60-61/5th October 1960.	MDE 1231—Checking and rectifying defects in dynamo.	Do.	16 49
46 G. 92/60-61/5th October 1960.	Van MSY 3808—Overhaul gear box ..	Assistant Agricultural Engineer, (Mechanical), Coimbatore.	39 90
47 G. 94/60-61/5th October 1960.	Repairs to motor in M. Block well ..	Farm Manager, Wet lands, Agricultural College and Research Institute, Coimbatore-3.	283 00
48 G. 95/60-61/6th October 1960.	Lorry MSC 9581—Check and rectify defects in inlet manifold.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	19 00
49 G. 96/60-61/7th October 1960.	Jeep MDC 7879—(1) Carburetor cleaning. (2) Valve adjustment. (3) Plug checked and changed. (4) Platinum point checked. (5) Other repairs attended.	Soil Survey Officer, Agricultural College and Research Institute, Coimbatore-3.	48 28
50 G. 97/1960-61/10th October 1960.	MSC 9612—(1) Repairs of king pin assembly. (2) Checking head light.	Assistant Agricultural Engineer (Inspection) Coimbatore, for Agricultural Engineering Supervisor (Tractor), Ootacamund.	70 34
51 G. 98/1960-61/10th October 1960.	Well No. 50—repairs to Electric motor and pumpset.	Farm Manager, Western Block, Central Farm, Coimbatore.	78 16
52 G. 99/1960-61/13th October 1960.	D4. 6U. 3670 Cylinder head—To insert new sleeves and to put cotton.	Assistant Agricultural Engineer (Inspection), Coimbatore.	68 51
53 G. 100/1960-61/14th October 1960.	Pump in well No. 68—Repairs to pump in well No. 68 of central Farm.	Superintendent, Central Farm, Coimbatore.	60 06
54 G. 1/1/1960-61/17th October 1960.	MSZ 5/48 jeep—(1) Repair radiator for leakage. (2) Check brakes. (3) Adjust front left wheel for shake.	Superintendent, Agricultural Research Station, Bhavanisagar.	24 90
55 G. 102/1960-61/18th October 1960.	Jeep MDC 9594—To fix up the silencer tube ..	Assistant Soil Chemist, Agricultural College and Research Institute, Coimbatore.	14 16
56 G. 103/1960-61/24th October 1960.	Lorry MSZ 2419—Replace carburetor parts (Kit supplied by party.)	Assistant Agricultural Engineer, (Inspection), Coimbatore. (Drilling).	5 50
57 G. 104/1960-61/24th October 1960.	Lorry MSC 9551—Dismantle engine part by part ..	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	18 19

APPENDIX 24—cont.

Serial number, work order and date. *As work orders completed during the year from 1st July 1960 to 30th June 1961—cont.*

<i>Serial number, work order and date.</i> (1)	<i>Particulars.</i> (2)	<i>Authority.</i> (3)	<i>Amount.</i> (4) Rs. RsP.
58 G. 105/1960-61/25th October 1960.	Lorry MSC 9594—(1) Engine overhauling. (2) Brake system overhauling.	Assistant Agricultural Engineer (Research), Coimbatore.	369 63
59 G. 107/1960-61/26th October 1960.	Jeep MDJ 22 9—(1) Welding the rear seat (2) Other repairs attended.	Assistant Agricultural Engineer, Soil Conservation Scheme, Ooty a.r.u.l.	141 25
60 G. 107/1960-61/27th October 1960.	Bus MDC 9718—(1) Renew 'U' clamp for front s rings.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	34 33
61 G. 108/1960-61/29th October 1960.	Central Well Pumpset S.S.F., Veerakeralam ..	Farm Manager, State Seed Farm, Veerakeralam.	96 53
62 G. 107/1960-61/31st October 1960.	MSC 9551 Lorry—Attend to patch up work to lorry.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	159 69
63 G. 110/1960-61/31st October 1960.	Farmal tractor MDC 9218—(1) Attend to repair the self starter. Charging of battery.	Director Sugarcane Breeding Institute, Coimbatore.	17 63
64 G. 111/1960-61/31st October 1960.	New Area Well—Removing the engine and pump from the present bed assembling and setting the above in the newly formed bed.	Farm Manager, Eastern Block, Central Farm, Coimbatore.	248 45
65 G. 112/1960-61/3rd November 1960.	MSC 9618 Lorry—Attending to minor repairs before brake inspection.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	285 03
66 G. 117/1960-61/3rd November 1960.	Well No. 50—Repair the centrifugal pump ..	Farm Manager, Western Block, Central Farm, Coimbatore.	95 40
67 G. 114/1960-61/4th November 1960.	Sending a machine to Cotton Breeding Station for setting right the centrifugal pump and pipe lines and repairing the electric motor and pump.	Farm Manager, Cotton Breeding Station, Coimbatore.	285 46
68 G. 115/1960-61/5th November 1960.	MSC 9551 Lorry—Overhaul engine ..	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	507 44
69 G. 116/1960-61/11th November 1960.	Lorry MSZ 2419—(1) Decarbonize engine after dismantling if found necessary. (2) Renew king pin bushes. (3) Check and adjust tie rod ends.	Assistant Agricultural Engineer (Inspection), Coimbatore.	737 19
70 G. 117/1960-61/12th November 1960.	MSC 9551 Lorry—Brake overhauling ..	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	65 63
71 G. 118/1960-61/12th November 1960.	Charging the batteries of DD7 engine—2 Nos. —	Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00
72 G. 119/1960-61/15th November 1960.	Well No. 50—Cleaning and servicing the electric motor.	Farm Manager, Western Block, Central Farm, Coimbatore.	30 52
73 G. 120/1960-61/23rd November 1960.	Repair to N.6 Tractor MDC 6775—(1) Oil seal replaced for both right and left wheel. (2) Choke lever for carburettor replaced. (3) Testing the magneto and attending to necessary repairs and parts replaced.	Superintendent, Agricultural Research Station, Bhavanisagar.	243 25
74 G. 121/1960-61/24th November 1960.	Van guard Van M.S.Y 3808—(1) Engine tune up and general check up. (2) Renewal of silencer muffler.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	160 74
75 G. 122/1960-61/26th November 1960.	MDC 9718 Bus—(1) Overhauling the distributor unit and checking the ignition system complete. (2) Overhauling carburettor and engine tuning up.	Do.	7 81
76 G. 123/1960-61/26th November 1960.	Jeep MSZ 4303—Overhaul differential ..	Assistant Agricultural Engineer (Inspection), Coimbatore.	16 41
77 G. 124/1960-61/27th November 1960.	40 Well—To repair and clean electric motor of compression make (7.5 H.P.) and drill holes in the bore plate.	Farm Manager, Western Block, Central Farm, Coimbatore.	124 63
78 G. 125/1960-61/30th November 1960.	Bus MDJ 9718—To attend the ignition troubles ..	Assistant Agricultural Engineer (Mechanical), Coimbatore.	5 50
79 G. 123/1960-61/5th December 1960.	Lorry MSC 9551—Painting the body before brake inspection.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	221 36
80 G. 127/1960-61/6th December 1960.	M.H. 20K. Tractor MDC 4517—Repair Dynamo ..	Superintendent, Central Farm, Coimbatore.	42 83
81 G. 128/1960-61/9th December 1960.	Van MSY 3808—Overhaul the fuel and ignition system.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	23 28
82 G. 123/1960-61/12th December 1960.	John Deere Tractor MDC 5879—Recondition the silencer.	Farm Manager, Central Farm, Coimbatore.	20 16

APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

<i>Serial number, work order and date.</i>	<i>Particulars.</i> (2)	<i>Authority.</i> (3)	<i>Amount.</i> (4)
(1)			Rs. R.P.
83 G. 130/1960-61/12th December 1960.	Jeep MDC 8501—Repairs to the following—(1) Self starter. (2) Brakes and wheels. (3) Star Joints. (4) Carburettor kit changing. (5) Clutch assembly checking and repairing. (6) Steering assembly.	Assistant Agricultural Engineer, Soil Conservation, Coimbatore-2.	375 37
84 G. 131/1960-61/12th December 1960.	Jeep MDC 9594—Charge the 6 Volt battery ..	Assistant Soil Chemist, Agricultural College and Research Institute, Coimbatore.	3 00
85 G. 132/1960-61/16th December 1960.	Well No. 68—Rectifying troubles in the pump ..	Superintendent, Central Farm, Coimbatore.	21 00
86 G. 134/1960-61/17th December 1960.	Well No. 50 Erecting assembled motor and pump and providing wooden bed in the well No. 50.	Do.	142 56
87 G. 133/1960-61/17th December 1960.	Van MSY 3808—Check up brakes and engine ..	Assistant Agricultural Engineer (Mechanical), Coimbatore.	2 21
88 G. 135/1960-61/20th December 1960.	Bus MDC 9718—Renew the hand brake boring and adjust the brakes for the above.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	9 14
89 G. 136/1960-61/22nd December 1960.	ML C 9718 Bus, (1) Adjusting the steering. (2) Checking the brakes. (3) Setting right rattling of the body.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	9 14
90 G. 340/1960-61/31st December 1960.	MSC 9594 Lorry—(1) Checking the dynamo and its connection to the battery. (2) Checking the A.C. Pump and its connection.	Assistant Agricultural Engineer (Research), Coimbatore.	7 66
91 G. 141/1960-61/2nd January 1961.	'A' Block Pumps—Repairing the foot valve ..	Superintendent, Central Farm, Coimbatore.	33 04
92 G. 142/1960-61/2nd January 1961.	Wetlands—Attending the repairs to the motor of the pump set in 'M' block.	Do.	13 72
93 G. 143/1960-61/2nd January 1961.	Well No. 68—Repairing the pump	Do.	21 62

94 G. 144/1960-61/4th January 1961.	Bus MDC 9718—Setting right the defects in the ignition system.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	8 25
95 G. 145/1960-61/6th January 1961.	Well No. 68—Repairing the motor	Superintendent, Central Farm, Coimbatore.	33 04
96 G. 146/1960-61/9th January 1961.	Powers prayer—Repairing the power sprayer ..	Entomologist, Agricultural and Research College Institute Coimbatore.	16 52
97 G. 147/1960-61/9th January 1961.	Van MSY 3808—Checking the speedometer connection.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	8 05
98 G. 151/1960-61/19th January 1961.	Lorry MSZ 2419—Attending to the repairs of the dynamo.	Assistant Agricultural Engineer (1), Coimbatore.	14 80
99 G. 152/1960-61/20th January 1961.	Tractor W. 6 MDC 6775—Testing the spark plugs.	Superintendent, Agricultural Research Station, Bhavanisagar.	16 52
100 G. 153/1960-61/21st January 1961.	Jeep MDC 8501—(1) Tuning the engine. (2) Repairs to clutch (3) General check up.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	74 49
101 G. 154/1960-61/24th January 1961.	Lorry MSC 9551—Removing broken studs from the rear wheel drums and fixing new studs.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore-3.	74 71
102 G. 155/1960-61/25th January 1961.	Van MSY 3808—1) Engine tune up. (2) Set right the electric horn.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	31 76
103 G. 157/1960-61/27th January 1961.	Van MSY 3808—General check up of the engine ..	Do.	16 86
104 G. 158/1960-61/31st January 1961.	Tractor 20 K MDC 4517—(1) Examining the tractor. (2) Preparing estimates.	Superintendent Central Farm, Coimbatore.	8 50
105 G. 138/1960-61/26th December 1960.	Jeep MDC 9594—Major overhauling	Professor of Soil Science, Agricultural College and Research Institute Coimbatore.	391 71
106 G. 137/1960-61/30th December 1960.	Lorry MSC 9551—(1) Attending minor repairs (2) Attending brake system (3) Tuning up the engine.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	99 07
107 G. 159/1960-61/1st February 1961.	Well No. 68 Pump and motor—Changing the pump and motor to some other place.	Farm Manager, Eastern block, Central Farm, Coimbatore.	246 42
108 G. 160/1960-61/1st February 1961.	Lorry MSZ 2419—Attending to starting troubles ..	Assistant Agricultural Engineer (1), Coimbatore.	59 37
			25 40

APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number, work order and date. (1)	Particulars. (2)	Authority. (3)	Amount. (4) Rs. pP.
109 G. 161/1960-61/3rd February 1961.	Lorry MSC 9594—(1) Engine tune up (2) Checking up of propeller shaft and its joints.	Assistant Agricultural Engineer (Research), Coimbatore.	20 64
110 G. 162/1960-61/3rd February 1961.	Jeep MDC 85.1—(1) Dismantling the engine. (2) Examining the engine and (3) Preparation of estimate.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	6 36
111 C. 163/1960-61/3rd February 1961.	Jeep MDC 1231—Changing of pinion oil seal ..	District Agricultural Officer, Coimbatore.	5 50
112 G. 164/1960-61/7th February 1961.	Lorry MSZ 2419—Refacing the valves of the lorry (exhaust and inlet 12 numbers.)	Assistant Agricultural Engineer (Inspection), Coimbatore.	62 00
113 G. 165/1960-61/9th February 1961.	Lorry MSC 9551—(1) Repairs to dynamo and (2) Reconditioning radiator.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	97 06
114 G. 166/1960-61/10th February 1961.	M.H. Tractor MDC 4517—(1) Engine tune up and (2) General repairs (as per estimate approved.)	Superintendent, Central Farm, Coimbatore.	130 03
115 G. 167/1960-61/10th February 1961.	Well No. 77—(1) Installing 77 well pump in well No. 77 of central farm (2) Manufacturing grease cup (3) Manufacturing air valves.	Farm Manager, Eastern block, Central Farm, Coimbatore.	19 49
116 G. 168/1960-61/14th February 1961.	MDC-9718 Bus—(1) Attending to the leakage of oil in the steering assembly.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	14 80
117 G. 169/1960-61/16th February 1961.	Jeep MDE 1231—(1) Changing A.C. pump kit. (2) Changing of petrol tank.	District Agricultural Officer, Coimbatore.	116 11
118 G. 170/1960-61/18th February 1961.	Well No. 68—Repairing the motor and pumpset ..	Superintendent, Central Farm, Coimbatore.	52 97
119 G. 172/1960-61/21st February 1961.	Lorry MSC 9551—(1) Overhauling the self starter (2) Changing pinion oil seal.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	23 70
120 G. 173/1960-61/21st February 1961.	John Deere Tractor MDC 5879—Reconditioning the hose pipe.	Farm Manager, Central Farm, Coimbatore.	
121 G. 176/1960-61/27th February 1961.	Jeep MDC 9594—(1) Repairs to clutch (2) Testing fuel line.	Agricultural Chemist and Association Professor of Soil Science, A. C. and R.I., Coimbatore.	2 55
122 G. 187/1960-61/22nd February 1960.	Drill D.D.6. Stridebaker truck—Setting right brake system complete.	Assistant Agricultural Engineer (Inspection), Coimbatore, (Drilling).	505 30
123 G. 148/1960-61/10th February 1961.	Cylinder heads of R.B.U. II. Darman engine—Seating of valves to cylinder head of Darman engine.	Assistant Agricultural Engineer (Inspection), Coimbatore (Drilling).	64 23
124 G. 149/1960-61/16th January 1961.	Jeep MSZ 4203—(1) Tuning up the engine (2) Cleaning the petrol tank.	Assistant Agricultural Engineer (Inspection), Coimbatore.	27 46
125 G. 150/1960-61/17th January 1961.	Rockblasting unit II—Overhauling of the engine ..	Assistant Agricultural Engineer (Inspection), Coimbatore, (Drilling).	248 24
126 G. 156/1960-61/27th January 1961.	Wolf valve refacer—Replacing the armature to the above.	Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	312 09
127 G. 176/1960-61/2nd March 1961.	Jeep MDE 1231—(1) Adjustment of valves (2) adjustment of brakes.	District Agricultural Officer, Coimbatore.	18 58
128 G. 177/1960-61/3rd March 1960.	John Deere Tractor MDE 5879—(1) Attending oil leak (2) Minor repairs (3) Adjusting brake system.	Senior Farm Manager, Central Farm, Coimbatore.	40 38
129 G. 179/1960-61/3rd March 1961.	A.V. II. petter—(1) Examining the injectors of A.V. II. petter and do the needful.	Assistant Agricultural Engineer (Inspection), Coimbatore.	2 55
130 G. 178/1960-61/3rd March 1961.	Van MSY 3808—(1) Engine decarbonizing (2) Attending suspension (3) Attending king pin (4) Brake overhauling, etc.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	423 45
131 G. 180/1960-61/8th March 1961.	Jeep MDE 1231—(1) Replacing of brake lines (2) Overhauling the brakes (3) Fixing side indicators.	District Agricultural Officer, Coimbatore.	22 42
132 G. 181/1960-61/13th March 1961.	Bus MDC 9718—(1) Overhauling of self starter (2) General checkup.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	47 58
133 G. 183/1960-61/14th March 1961.	50 well Motor—(1) Repairing the gland packing of 50 well motor of western block.	Farm Manager, Western block, Central Farm, Coimbatore.	84 52
134 G. 184/1960-61/15th March 1961.	Jeep MSZ 5348—(1) Welding the right and left mudguards (2) Reconditioning of top (hood) (3) Fitting up one back seat.	Superintendent, Agricultural Resident Station, Bhavanisagar.	67 70

APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number and work order number.

(1)	(2)	(3)	Amounts. (4)
Serial number and work order number.	Particulars.	Authority.	Rs. M.P.
135 G. 185/1960-61/15th March 1961.	D4 cylinder head—Reconditioning the D4 cylinder head by cutting and inserting sleeves and cutting valves, seats, etc.	Agricultural Engineer Supervisor (Tractors), Ooty.	73 90
136 G. 186/1960-61/15th March 1961.	Well No. 40—Repairing the pump of well No. 40 ..	Farm Manager, Western Block, Central Farm, Coimbatore.	74 99
137 G. 187/1960-61/16th March 1961.	Lorry MSC 9551—(1) Changing speedometer inner cable (2) Overhauling dynamo (3) Changing of new spark plugs (4) Changing of high tension leads (5) Cheesing of valves (6) Reconditioning hand brake, etc.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	244 16
138 G. 189/1960-61/24th March 1961.	Jeep MDE 1231—(1) Repairing leakage in radiator (2) Engine tune up.	District Agricultural Officer, Coimbatore.	10 22
139 G. 171/1960-61/20th February 1961.	Jeep MDC 8501—Overhauling the engine as per estimate.	Assistant Agricultural Engineer (Soil Conservation), Coimbatore.	231 81
140 G. 174/1960-61/24th February 1961.	Van MSY 3808—Preparation of estimates as per the endorsement of the Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	Assistant Agricultural Engineer (Mechanical), Coimbatore.	47 23
141 G. 1/1961-62/1st April 1961 ..	Hydraulic press—Repairing the hydraulic press ..	Assistant Agricultural Engineer (Inspection), Coimbatore, for Agricultural Engineering Supervisor (Tractor), Ooty.	39 56
142 G. 2/1961-62/1st April 1961 ..	Cream separator—Repairing the cream separator..	Horticulturist and Associate Professor of Horticulture A.C., K.L. Coimbatore.	21 51
143 G. 3/1961-62/3rd April 1961..	Lorry MSC 9551—Repairing the Self starter ..	Assistant Agricultural Engineer, (Tractor Workshop), Coimbatore.	20 59
144 G. 4/1961-62/2nd April 1961..	Jeep MDC 9594—Painting the jeep ..	Assistant Soil Chemist, Agriculture College and Research Institute, Coimbatore.	53 95
145 G. 5/1961-62/3rd April 1961..	Lorry MSC 9551—Reconditioning the seats (Two pairs) of the lorry.	Assistant Agricultural Engineer, (Tractor Workshop), Coimbatore.	61 14
146 G. 6/1961-62/4th April 1961..	New area well—Repairing the pump ..	Superintendent Central Farm, Coimbatore.	84 84
147 G. 7/1961-62/4th April 1961..	Electric Motor and pumpset—Fitting the electric motor and pumpset in a new bed.	Superintendent, Central Farm, Coimbatore.	23 72
148 G. 8/1961-62/4th April 1961..	Lorry MSC 9583—Repairs to brake system complete (2) Renewal of king pin kit.	Assistant Director (Drilling), Salem.	85 74
149 G. 9/1961-62/5th April 1961 ..	Jeep MDC 8501—Fitting one set of electric horn.	Assistant Agricultural Engineer (Soil Conservation), Coimbatore.	13 77
150 G. 10/1961-62/5th April 1961.	Jeep MSZ 5048—(1) Testing the radiator and reconditioning the same if found necessary (2) Periodical check up.	Superintendent, Agricultural Research Station, Bhavanisagar.	15 00
151 G. 11/1961-62/5th April 1961.	New area well—Repairing the 7-5-H.P. P.S.G. motor.	Superintendent, Central Farm, Coimbatore.	22 88
152 G. 12/1961-62/5th April 1961.	P.S.G. Motor—Cleaning the motor ..	Superintendent, Central Farm, Coimbatore.	25 14
153 G. 14/1961-62/6th April 1961.	Carburettor—(1) Reconditioning the air passage (2) Cleaning the threads of air screw.	Crop and Plant Protection Officer, R.S. Puram, Coimbatore.	7 84
154 G. 15/1961-62/8th April 1961.	Power duster—(1) Repairing the engine (2) Other required adjustments.	Crop and Plant Protection Officer, R.S. Puram, Coimbatore.	5 36
155 G. 16/1961-62/8th April 1961.	Jeep MDC 9594—Attending to (1) Leak in the gear box (2) Self starter trouble (3) Wheel wabbling (4) Rewind winch.	Assistant Soil Chemist, Agricultural College and Research Institute, Coimbatore.	37 86
156 G. 17/1961-62/10th April 1961.	Van MDO 1103—(1) Servicing the van (?) Soldering the radiator (3) Charging the battery (4) Reconditioning the side door lock (5) Stitching the hood.	Assistant in charge, Kallar and Burliar Fruit Station, Mettupalayam.	28 30

APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number, work order and date.	(1)	Particulars.	(2)	Authority.	Amount.
				(3)	(4) RS. RP.
157	G. 18/1961-62/10th 1961.	Lorry MSC 9589—(1) Cleaning carburettor (2) Servicing dynamo (3) Adjusting cut out (4) Welding the body (5) Checking light connections (6) Renewing accelerator spring (7) Crank case packing renewing.		Assistant Director, (Drilling) Salem.	73
158	G. 19/1961-62/11th 1961.	Jeep MDC 7879—(1) Replacing carburettor kit. (2) Replacing universal joints (3) Replacing contact breaker set (4) Replacing silencer and its extension.		Soil Survey Officer, Agriculture College and Research Institute, Coimbatore.	16 83
159	G. 20/1961-62/11th 1961.	Ceiling fan.—Fitting new bearings to the fan.		Assistant Agricultural Engineer (Mechanical), Coimbatore.	2 75
160	G. 21/1961-62/12th 1961.	Lorry MSC-9612—Soldering the radiator of the lorry.		Assistant Agricultural Engineer (Inspection), Coimbatore.	5 86
161	G. 22/1961-62/12th 1961.	Pulley and base plates—(1) Reconditioning the old pulley to suit 7.5 H.P. motor (2) Reconditioning the pump set base plate to suit the 7.5 H.P. motor.		Superintendent, Central Farm, Coimbatore.	93 34
162	G. 23/1961-62/18th 1961.	Bus MDC. 9718—Preparation of estimates after examining the vehicle.		Assistant Agricultural Engineer (Mechanical), Coimbatore.	65 16
163	G. 24/1961-62/24th 1961.	Parimal MDC 8349 tractor—Preparing estimates by examining the tractor.		Sri R.V.B. Gopalaraman Guptha, Mi-asadar, Udumalpet. (Private party).	37 71
164	G. 25/1961-62/24th 1961.	Jeep MSZ. 5078—(1) Fixing new radiator core (2) Minor repairs.		Superintendent, Agricultural Research Station, Bhavanisagar.	16 50
165	G. 26/1961-62/25th 1961.	Lorry MSC. 9581—Attending to the brake down of the lorry at Karumathampatty.		Deputy Director of Agriculture, Coimbatore.	49 01

166	G. 27/1961-62/26th 1961.	Foot valve—Reconditioning the foot valve	..	Superintendent, Central Farm, Coimbatore.	6 56
167	G. 28/1961-62/27th 1961.	Batteries—Charging the 'Amco' batteries	..	Assistant Agricultural Engineer (Inspection), Coimbatore, (Drilling) Salem.	6 00
168	G. 182/1960-51/13th March 1961.	Track chain—Servicing of D. 6 caterpillar chain (1 set).		Assistant Director, (Drilling) Salem.	291 14
169	G. 30/1961-62/1st May 1961.	Bus MDC. 9718—(1) Reconditioning dents in the body. (2) Body rotting (3) Replacing radiator core (4) Leakage in steering and gear box. (5) Providing ignition key with switch (6) Painting the body wherever it is necessary.		Assistant Agricultural Engineer (Inspection), Coimbatore.	197 81
170	G. 32/1961-62/3rd May 1961.	Well No. 50 Motor—Fitting up 10 H.P. motor in the place of 7.5 H.P. to the above well.			6 36
171	G. 33/1961-62/3rd May 1961.	Table fan—Reconditioning the table fan	..	Superintendent Central Farm, Coimbatore. Horticulturist and Associate Professor of Horticulture.	11 50
172	G. 34/1961-62/3rd May 1961.	Service Press—(1) Examining the press. (2) Executing the work.		Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	100 00
173	G. 35/1961-62/3rd May 1961.	Track chain—(1) Servicing the track chains 2 Nos. (2) Preparation of estimate (3) Dismantling the grouser plate track pins, links and broken bushes.		Assistant Agricultural Engineer M.B. Shed, Madras-15.	175 00
174	G. 36/1961-62/3rd May 1961.	John Deere tractor MDC. 5879—Seating right back wheel hub (2) Minor repairs.		Superintendent, Central Farm, Coimbatore.	8 03
175	G. 37/1961-62/4th May 1961.	'Amco' batteries—Charging the batteries 2 Nos. ..		Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00
176	G. 38/1961-62/4th May 1961.	Jeep MSZ. 5048—(1) Preparation of estimate after checking clutch assembly (2) Executing of work.		Superintendent, Agricultural Research Station, Bhavanisagar.	320 00
177	G. 39/1961-62/4th May 1961.	Lorry MSC. 9581—(1) Replacing camshaft gear. timing oil seal and engine mount front. (2) Minor repairs.		District Agricultural Officer, Krishnagiri.	170 00
178	G. 40/1961-62/4th May 1961.	Jeep MDC. 8501—(1) Replacing water pump (2) Engine tune up.		Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	6 00
179	G. 41/1961-62/4th May 1961.	Hydro inflator—Providing one adaptor and one nipple.		Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	64 00

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APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number work order and date.	Particulars.	Authority.	Amount.
	(1)	(2)	(3)
	(1)	(2)	(3)
180 G. 43/1961-62/9th May 1961.	Bus M.D.E. 3413—(1) Reconditioning the luggage carrier of the Bus, by reducing the height of the carrier (Under this work order only the estimate was prepared and the actual work will be taken up in a separate work order after approval of estimate).	Extension Specialist, Coimbatore.	8 00
181 G. 44/1961-62/9th May 1961.	Batteries 'Amco'—Charging the batteries—2 Nos.	Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00
182 G. 45/1961-62/9th May 1961.	Jeep MDC. 3362—(1) Testing the vehicle (2) Executing the Repairs. (3) Minor repairs.	District Agricultural Officer, Erode.	28 00
183 G. 46/1961-62/10th May 1961.	John Deere MDC. 5879—(1) Setting right the back wheel hub and reconditioning the same (2) Minor repair.	Superintendent, Central Farm.	56 00
184 G. 47/61-62/12th May 1961 ..	Lorry MSC 9561—(1) Dismantling the rear spring. (2) Replacing the broken main leaf with a new one.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	30 00
185 G. 48/61-62/12th May 1961 ..	Jeep MDC 8501—(1) Cylinder head gasket renewing. (2) Engine tune up.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	40 00
186 G. 49/61-62/15th May 1961 ..	Lorry MSC 9612—Engine block—(1) Examining the liners, crank shaft and bearing. (2) Preparation of estimate.	Assistant Agricultural Engineer (Inspection), Coimbatore.	30 00
187 G. 50/61-62/17th May 1961 ..	Land Rover MSZ 2687—Examining the clutch assembly.	Assistant Agricultural Engineer (Inspection), Madurai.	42 00
188 G. 51/61-62/22nd May 1961 ..	'Amco' battery—Charging the batteries 6 volts—2 Numbers.	Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00

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Serial number work order and date.	Particulars.	Authority.	Amount.
	(1)	(2)	(3)
	(1)	(2)	(3)
189 G. 52/61-62/22nd May 1961 ..	Jeep MDC 8501—(1) Examining the jeep's engine. (2) Preparation of estimate.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	9 00
190 G. 53/61-62/23rd May 1961 ..	Van MDO 1103—(1) Servicing the van. (2) Cleaning the A.C. pump and changing washers. (3) Cleaning the petrol tank. (4) Charging the battery.	Assistant in charge, Kallar Fruit gardens.	10 00
191 G. 54/61-62/23rd May 1961 ..	Ford Jeep MDC 3362—(1) Replacing clutch assembly. (2) Renewal of bell crank assembly. (3) Servicing dynamo. (4) Servicing self starter. (5) Engine tune up. (6) Changing gear box oil seal. (7) Changing the spark plugs. (8) Changing the propeller shaft. (9) Minor repairs.	District Agricultural Officer, Erode.	200 00
192 G. 55/61-62/23rd May 1961 ..	Jeep MDC 8501—(1) Valve grinding and seating. (2) Putting expander to the piston rings. (3) Engine tune up.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	64 00
193 G. 56/61-62/24th May 1961 ..	Bus MDC 9718—Servicing the bus MDC 9718 ..	Assistant Agricultural Engineer (Mechanical), Coimbatore.	10 00
194 G. 57/61-62/27th May 1961 ..	Batteries—Charging the 6 volts 'Amco' batteries 2 Numbers.	Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00
195 G. 58/61-62/27th May 1961 ..	Battery MDC 9594—Charging the 6 volts Exide battery.	Assistant Soil Chemist, Agricultural Conservation and Research Institute, Coimbatore.	3 00
196 G. 59/61-62/27th May 1961 ..	Battery MSC 9638—Charging the 6 volts battery ..	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	3 00
197 G. 60/61-62/27th May 1961 ..	Massey Harris Tractor—Attending to starting troubles of the tractor.	Superintendent, Central Farm, Coimbatore.	7 00
198 G. 61/61-62/29th May 1961 ..	Jeep MSZ 5048—Preparation of estimate by examining the above vehicle.	Superintendent, Agricultural Research Station, Bhavanisagar.	28 00
199 G. 188/60-61/21st March 1961.	'J' block well—wet lands—(1) Manufacturing and supplying of sliding rails as per measurements. (2) Supplying one 5" G.I. cluding. (3) Supplying one 8" G.I. pipe of length 3' 8" threaded both ends	Superintendent, Central Farm, Coimbatore.	180 00
200 G. 18/61-62/3rd April 1961 ..	40 well :—Repairing the pump	Do.	205 68

APPENDIX 24—cont.

List of work orders completed during the year from 1st July to 30th June 1961—cont.

Serial number' work order and date.	Particulars. (2)	Authority. (3)	Amount. (4)
(1)			
201 G. 29/61-62/28th April 1961 ..	Jeep MDC 8601—(1) Checking and repairing clutch assy. (2) Servicing dynamo.	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	54 37
202 G. 62/61-62/1st June 1961 ..	Jeep MSZ 5048—(1) Overhauling of brake system. (2) Changing front axle seal. (3) Changing front axle penion seal. (4) Replacing brake hose rear. (5) Engine tune up. (6) Other minor repairs.	Superintendent, Agricultural Research Station, Bhavani- sagar.	154 00
203 G. 63/61-62/1st June 1961 ..	Lorry MSC 9551—Servicing the lorry	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	3 50
204 G. 64/61-62/1st June 1961 ..	'Amco' batteries—Charging the 6 volts batteries belongs to D.D. 10.	Assistant Agricultural Engineer, (Inspection), Coimbatore (Drilling).	6 00
205 G. 65/61-62/3rd June 1961 ..	Jeep MDC 8501—Servicing the jeep	Assistant Agricultural Engineer, Soil Conservation Scheme, Coimbatore.	10 00
206 G. 66/61-62/3rd June 1961 ..	Lorry MSC 9551—(1) Examining the engine, etc. (2) Preparation of estimate. (3) Changing the clutch disc. (4) Servicing the engine. (5) Engine tune up. (6) Other minor repair.	Assistant Agricultural Engineer, Tractor Workshop, Coimbatore.	170 00
207 G. 67/61-62/3rd June 1961 ..	J. block well—Installing the oil engine in the new bed.	Superintendent, Central Farm, Coimbatore.	85 00
208 G. 68/61-62/6th June 1961 ..	Luggage carrier—Reconditioning the luggage carrier of the bus MDE 3413 as per estimate.	Extension Specialist, Agricul- tural college and Research Institute, Coimbatore.	57 00
209 G. 70/61-62/6th June 1961 ..	Van MSY 3808—Preparation of estimate by examining the vehicle.	Assistant Agricultural Engineer, (Mechanical) Coimbatore.	16 71

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10 G. 71/61-62/8th June 1961 ..	Well number 77—Preparation of estimate by examining the motor and pumps set of the well.	Superintendent, Central Farm, Coimbatore.	16 00
11 G. 72/61-62/8th June 1961 ..	Van MSY 3808—(1) Adjusting the brakes. (2) Rep- lacing the silencer extension pipe with a new one (3) Changing the condensor. (4) Engine tune up.	Assistant Agriculture Engineer, (Mechanical), Coimbatore.	53 00
212 G. 73/61-62/13th June 1961.	Jeep MDE 1231—Adjustment of the brake system of the vehicle.	District Agricultural Officer, Coimbatore.	4 80
213 G. 74/61-62/14th June 1961.	Batteries—Charging the 'Amco' batteries. 6 volts- 2 Nos.	Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00
214 G. 75/61-62/14th June 1961.	'M' Block—Overhauling the oil engine of the above block. (2) Preparation of estimate only.	Superintendent, Central Farm, Coimbatore.	32 00
215 G. 76/61-62/14th June 1961.	Valves—Facing of 8 valves of D7. tractor 7126 ..	Assistant Agricultural Engineer (Inspection) Coimbatore.	5 10
216 G. 77/61-62/14th June 1961.	'J8' Block—Preparation of estimate by examining the oil engine of the above block for overhauling.	Superintendent, Central Farm, Coimbatore.	16 00
217 G. 78/61-62/14th June 1961.	Foot Valve—Preparation of estimate for repairing the 'J' block foot valve and setting right at site.	Do.	12 72
218 G. 79/61-62/16th June 1961.	Bus MDE 3413—(1) Adjustment of brakes. (2) Rectifying defects in the switch line. (3) Engine tune up. (4) Front wheel alignment.	Extension Specialist, Agricul- tural College and Research Insti- tute, Coimbatore.	30 00
219 G. 80/61-62/17th June 1961.	Lorry MSC 963g—Preparation of estimate by examining the lorry for brake inspection.	Assistant Agricultural Engineer, (Inspection), Coimbatore.	43 00
220 G. 81/61-62/19th June 1961.	Jeep MDC 8501—(1) Preparation of estimate by examining the jeep.	Assistant Agricultural Engineer Soil Conservation Scheme, Coimbatore.	2 55
221 G. 82/61-62/19th June 1961.	John Daore MDC 5379—Inspecting the vehicle at site and rectifying the defects.	Superintendent, Central Farm, Coimbatore.	5 50
222 G. 83/61-62/20th June 1961.	Jeep MDC 8501—(1) Removing the radiator and soldering the same. (2) Attending to horn wire connection. (3) Assembling the radiator to the engine.	Assistant Agricultural Engineer Soil Conservation Scheme, Coimbatore.	24 00
223 G. 84/61-62/22nd June 1961.	Jeep MSZ 4203—Preparation of estimate by exami- ning the engine, etc. of the jeep.	Assistant Agricultural Engineer (I), Coimbatore.	47 00
224 G. 85/61-62/22nd June 1961.	Van MDO 1103—Servicing of the vehicle	Assistant Horticulturist, Coonoor.	10 71

APPENDIX 24—cont.

List of work orders completed during the year from 1st July 1960 to 30th June 1961—cont.

Serial number, work order and date.	Particulars.	Authority.	Amount.
(1)	(2)	(3)	(4)
225 G. 86/61-62 1..	Van MDO 1103—(1) Cleaning the carburettor. (2) Attending to wire connections of head light. (3) Fixing weldock bolt and nuts. (4) Attending to danger light of connections. (5) Changing shock absorber oil. (6) Changing engine oil. (7) Adjusting brake. (8) Adjusting clutch etc.	Assistant Horticulturist, Coonor.	30 00
226 G. 87/61-62/23rd June 1961.	Jeep MSZ 4203—(1) Attending to steering system. (2) Overhauling brake system. (3) Adjustment of clutch. (4) Changing rear shock absorbers. (5) Changing wheel cylinder kit complete. (6) Changing 'U' clamps.	Assistant Agricultural Engineer (Inspection), Coimbatore.	90 00
227 G. 88/61-62/27th June 1961.	Jeep MSZ 5048—Servicing of the above jeep ..	Superintendent, Agricultural Research Station, Bhavanisagar.	10 00
228 G. 89/61-62/27th June 1961.	Van MSZ 5851—(1) Cleaning the carburettor. (2) Setting right the defects.	Director of Agriculture, Madras.	6 36
229 G. 92/61-62/29th June 1961.	Valves—Refacing D7. valves (exhaust valves 4 Nos.).	Assistant Agricultural Engineer (Inspection), Coimbatore.	..
230 G. 93/61-62/29th June 1961.	New area—Fitting up pipes and flanges in the newly erected motor and pump set.	Superintendent, Central Farm, Coimbatore.	44 00
231 G. 94/61-62/30th June 1961.	Batteries—Charging batteries 6 volts 2 Nos. of D.D.7 Drill.	Assistant Agricultural Engineer (Inspection), Coimbatore.	6 00
		Total	19,767 68

APPENDIX 25.

Statement showing the pests of crops tackled and savings effected during the year 1960-61.

(a) NORTHERN REGION.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money value.
(1)	(2)	(3)	(4)	(5)	(6)
		ACR.	CENT.		RS.
Paddy—					
Schenobius incertulas. W. (stem borer).	Spraying parathion 0.025 per cent (or) BHC. 0.05 per cent.	84,434	20	3,127½	9,38,325
Nephotettix bipunctatus. F. (green jassids).	Dusting DDT. 5 per cent dust.	5,056	20	188	56,400
Tettigoniella spectra D. (White jassid).	Dusting BHC. 10 per cent dust.	3,677	20	136½	40,875
Green and white jassid.	Dusting a mixture of BHC. 10 per cent and DDT. 5 per cent.	1,23,010	20	4,555½	13,66,725
Thrips oryzae W. (Thrips paddy).	Dusting BHC. 10 per cent.	1,498	20	55½	16,575
Riparsia oryzae Gr. (Mealy bug).	Parathion 0.05 per cent spray.	1,634	20	60½	18,225
Nymphula Depunotalis G. (Case worm).	Spraying BHC. 0.05 per cent.	3,764	20	139½	41,775
Spodoptera mauritia B. (Army worm).	Dusting BHC. 10 per cent.	3,940	20	145½	43,725
Grass hopper ..	Do.	758	20	28½	8,625
Pachidiplosia oryzae (Gall fly).	DDT. 0.1 per cent spraying.	327	20	12	3,600
Cnaphalocrosis medialis. G. (leaf roller).	Dusting BHC. 10 per cent.	56	20	2	600
Leptocoris acuta (earhead bug).	Do.	2,942	20	109	32,700
Hispa armigera OP. (Rice hispa).	Do.	60	20	2½	675
(Rata) Bandicota bengalensis. a.	Baiting with zinc phosphide.	9,757	5	361½	1,08,375
Stemborer and jassids.	Spraying parathion 0.025 per cent.	9,864	20	365½	1,09,575
Atherigone ..	Dusting BHC. 10 per cent.	2,000	20	75	22,500
Thrips, Atherigone leaf roller, white jassids and case worm.	Spraying BHC. 0.05 per cent.	15,218	20	563½	1,69,050
Thrips and Jassids ..	Do.	1,968	20	73	21,900
Leaf eating caterpillar.	Do.	939	20	35	10,500
Jassids and caseworm.	Do.	3,696	20	137	41,100
Thrips and Grass hepper.	Do.	43	20	1½	525

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

(a) NORTHERN REGION—cont.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity in tons saved.	Money value.
(1)	(2)	(3)	(4)	(5)	(6)
		ACS.	PER CENT.		RS.
Millets—					
Cholam—					
Calocoris angustatus (Ear head bug).	Dusting BHC. 10 per cent dust.	6,561	20	243	60,750
Oligonychus indicus. H. (Mite).	Dusting Sulphur dust.	167	20	7	1,750
Chiloazonellus. S. (Stem-borer).	Spraying BHC. 0.05 per cent.	90	20	3½	813
Ragi—					
Laphygma exigua Hb. (Cutworm).	Dusting DDT. 5 per cent.	579	20	21½	5,313
Sesamia inferens W. (Stem borer).	Spraying BHC. 0.05 per cent.	1,317	20	49	12,250
Jassids	Dusting BHC. 10 per cent.	50	20	1½	375
Thrips	Do.	56	20	2	500
Tertraeneura hirsuta B. (Root aphids).	Drenching the soil with BHC. 0.05 per cent.	70	20	2½	688
Jassids and caterpillar.	Spraying BHC. 0.05 per cent.	250	20	9½	2,375
Rats	Baiting with Zinc phosphide.	96	5	3½	875
Wheat—					
Rats	Baiting with Zinc phosphide.	180	5	6½	1,688
All food crops—					
Rats	Baiting with Zinc phosphide.	2,834	5	105	26,250
Vegetables—					
Brinjal—Epilachna beetle.	Application of calcium arsenate and lime (1:4.)	2,716	20	302	84,560
Fruit borer	Spraying Endrin 0.02 per cent.	14	20	1½	420
Tetranychus telarius L. (Mite).	Dusting sulphur dust.	156	20	17½	4,830
Epilachna, borer thrips caterpillar and Jassids.	Spraying parathion 0.025 per cent.	52	20	6	1,680
Epilachna beetle and borer	Do.	65	20	7	1,960

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

(a) NORTHERN REGION—cont.

Crop and pests.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity in tons saved.	Money value.
(1)	(2)	(3)	(4)	(5)	(6)
		ACS.	PER CENT.		RS.
Bhendai—					
Jassids	Applying DDT. 5 per cent.	81	20	9	2,520
Fruit borer	Spraying Endrin 0.02 per cent.	220	20	23½	6,510
Cabbage—					
Cut worm	Application of DDT. 0.1 per cent.	16	20	2	560
Aphids	Spraying Endrin 0.02 per cent.	37	20	4	1,120
Caterpillar	Do.	214	20	23½	6,650
Caterpillar and aphids.	Do.	343	20	38	10,640
Potato—					
Agrotis ypsilon. (cut worm).	R. Application of DDT. 0.1 per cent.	1,279	20	142	39,760
Cut worms and Rats.	Application of DDT. 0.1 per cent for cut worms and baiting with zinc phosphide for rats.	183	20	20	5,600
Rats	Baiting with zinc phosphide.	730	5	81	22,680
Epilachna beetle ..	Application of Calcium arsenate and lime (1:4).	125	20	13½	3,850
Onion—					
Thrips	Spraying BHC. 0.05 per cent.	795	20	88	24,640
Cut worm	Application of DDT. 0.1 per cent.	15	20	1½	490
Agathi—					
Caterpillar	Spraying BHC. 0.05 per cent.	55	20	6	1,480
Weevil	Do.	4	20	½	140
Caterpillar and weevil.	Do.	26	20	3	840
Lab Lab—					
Aphids	Spraying Endrin 0.02 per cent.	17	20	2	560
Peas—					
Aphids	Spraying Endrin 0.02 per cent.	86	20	9½	2,660

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

(a) 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.
Miscellaneous Vegetables—					
Caterpillar	Spraying Endrin 0.02 per cent.	87	20	9½	2,730
Cut worm	Application of DDT, 0.1 per cent.	227	20	25	7,000
Thrips	Spraying Endrin 0.02 per cent.	1	20	..	—
Aphids	Do.	49	20	5½	1,540
Cabbage and Cauliflower—					
Cut worm	Spraying Endrin 0.02 per cent.	146	20	16	4,480
Brinjal and Chillies—					
Tuber and Epilachna beetle.	Spraying Parathion 0.025 per cent.	272	20	30	8,400
Oilseed crops—					
Gingelly—					
Pod borer	Spraying DDT, 0.1 per cent.	30	20	..	1,500
Webber	Do.	148	20	..	7,400
Castor—					
Achoea Janata. L. (Samilooper).	Spraying Endrin 0.02 per cent.	262	20	..	13,100
Dishorocis punctiferalis. G. (Capsule borer).	Do.	10	20	..	500
Samilooper and hairy caterpillar.	Do.	263	20	..	13,150
Groundnut—					
Amsacta albistriga. M. (Red Hairy Caterpillar).	Dusting BHC. 10 per cent dust in the early stages and spraying Parathion 0.025 per cent at later stages.	19,681	20	..	9,84,050
		8456 (by aerial spray).	20	..	4,22,800
Thrips	Dusting BHC. 10 per cent.	580	20	..	26,500

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

(a) NORTHERN REGION.

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.
Stomopteryx sub-eivella. Zell. (Surul puchi).	Dusting DDT. 5 per cent.	8,056	20	..	4,02,800
Aphis craccivora. L. (Aphids).	Dusting BHC. 10 per cent	7,153	20	..	3,57,650
Surulpuchi and Aphids.	Dusting DDT. 5 per cent and BHC. 10 per cent.	1,185	20	..	59,250
Thrips and Aphids ..	Dusting BHC. 10 per cent.	102	20	..	5,100
Coconut—					
Oryctes rhinoceros. L. (Rhinoceros beetle)	Hooking out the beetle and application of BHC. 10 per cent and sand (1:1).	3,335	20	..	6,670
Nephantis Serinopa ..	By releasing parasites.	97,646	20	..	1,95,292
Black headed cutter-pillar.	By spraying DDT 50 per cent WP.	5,175	20	..	10,350
Spices—					
Chillies—					
Scirtothrips dorsalis. H (Thrips).	Spraying BHC. 0.05 per cent.	14,728	20	..	7,13,900
Prodenia litura. F. (Fruit borer).	Spraying Endrin 0.02 per cent.	1,375	20	..	68,750
Borer and thrips ..	Do.	736	20	..	39,300
Condiments and Norco-tics—					
Tobacco—					
Myzus persicae sul. (Aphids).	Spraying Endrin 0.02 per cent.	2,582	20	..	1,29,100
Prodenia litura F. (Cutworm).	Do.	1,251	20	..	62,550
Aphids and cutworm.	Do.	45	20	..	2,250
Coffee—					
Lacanium viride. G. (Green bug).	Spraying Parathion 1 oz. in 25 gallons of water.	200	20	..	10,000
Zeuzera coffeae. (Stem borer).	N. Smearing BHC. 50 per cent at 1 lb. in 5 gallons of water.	305	20	..	15,250

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

(a) NORTHERN REGION—cont.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money values.
(1)	(2)	(3)	(4)	(5)	(6)
		ACS.	PER CENT.		RS.
Tea—					
Tea mosquito ..	Spraying DDT. 50 per cent W.P. (0.1 per cent).	844	20	..	42,200
Chicory—					
Jassids	Dusting DDT. 5 per cent.	7	20	..	350
Sugar—					
Sugarcane—					
Chilo trass infuscatella Sn. (Early shoot borer).	Spraying Endrin 0.02 per cent.	1,450	20	4,350	1,30,500
Odontotermes obesus R. (Termites).	Application of Heptachlore 5 per cent.	260	20	780	23,400
Saccharicoccus sacchari G. (Mealy bug).	Spraying Parathion 0.05 per cent.	30	20	90	2,700
Top borer	Tagging the affected canes and destroying them.	10	20	30	900
Fibre crop—					
Cotton—					
Jassids	Application of Parathion 0.025 per cent.	5,499	20	..	2,74,950
Aphis gossypii G. (Aphids).	Do.	4,591	20	..	2,27,550
Platyedra gossypiella (Boll worm).	Application of Endrin 0.02 per cent.	1,791	20	..	89,550
Sylepta derogota F. (Leaf roller).	Dusting BHC. 10 per cent.	10	20	..	500
Psadococcus virgatus C. (Mealy bug).	Spraying Parathion 0.05 per cent.	320	20	..	16,000
Cosmophila erosa H. (Semilooper).	Dusting BHC. 10 per cent.	711	20	..	35,550
Heliothis, bug and Mealy bug.	Spraying Parathion.	3,125	20	..	1,56,250
Aphids, jassids, boll worm and sylepta.	Do.	423	20	..	21,150
Aphids and bollworm.	Spraying Endrin 0.02 per cent.	80	20	..	4,000
Hairy caterpillar ..	Do.	1,679	20	..	83,950
Jassids and Aphids ..	Do.	4,428	20	..	2,21,400

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

(a) 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.
Fruit trees—					
Mango—					
Idiocerus niveosparus L. (Hopper).	Spraying DDT 0.1 per cent.	61,560 NOS.	20	..	1,23,120
Citrus—					
Phyllocnistis citrella S. (Leaf miner).	Spraying DDT 0.1 per cent.	350 NOS.	20	..	700
Toxoptera citricoides (Ahpids).	Spraying Endrin 0.02 per cent.	753 NOS.	20	..	1,506
Papilo demoleus L. (Leaf eating caterpillar).	Spraying BHC 0.05 per cent.	1,548 NOS.	20	..	3,096
Aphids and caterpillar.	Spraying Endrine 0.02 per cent.	725 NOS.	20	..	1,450
Guava—					
Mealy bug	Spraying Parathion 0.05 per cent.	1,254 NOS.	20	..	2,508
Cashew—					
Semilooper	Spraying Endrine 0.02 per cent.	1,450 NOS.	20	..	2,900
Semilooper and cut worm.	Do.	7,000 NOS.	20	..	14,000
Grapevine—					
Scolodonta strigicollis M. (Flea beetle).	Spraying DDT 0.02 per cent.	6 ACRES.	20	..	..
Areca nut—					
Caseworm	Spraying Parathion 0.025 per cent.	19 ACRES.	20	..	13,900
Miscellaneous Fruit trees—					
Scales and Aphids	Spraying Parathion 0.05 per cent.	443 NOS.	20	..	886
Other crop—					
Betelvine Disphinctus politus M. (bug).	Spraying DDT 0.1 per cent.	89	20	..	4,400
Betelvine and Agathi—					
Aphids and beetle ..	Do.	152	20	..	3,100
Tapioca—					
Mealy bug	Spraying Parathion 0.05 per cent.	6	20	..	300
Flower plants—					
Caterpillar, Aphids, scales, mites.	Do.	55	20	..	55

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during the year 1960-61.

NORTHERN DISTRICTS OF MADRAS STATE.

Serial number and crop.	Disease.	Area tackled Ac/No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
1 Paddy	(a) Blast	2,180.00 10.00 2,141.00 4,805.00 4,040.00 874.00	TONS. 502.1	Coimbatore. Nilgiris. Salem. South Arcot. Chingleput. North Arcot.
	Total	14,050.00		
	(b) Helminthosporium.	1,262.00 966.00 6,654.00 1,068.00 5,380.00		Coimbatore. Salem. South Arcot. North Arcot. Chingleput.
	Total	15,330.00	497.1	
	(c) Seed-borne diseases.	5,606.00 80.00 25,085.00 5,820.00 3,801.00 2,968.00		Coimbatore. Nilgiris. South Arcot. North Arcot. Salem. Chingleput.
	Total	43,360.00	1,548.6	
	(d) Stem rot	1,050.00	37.5	South Arcot.
	(e) Algal growth.	155.00 734.00		South Arcot. North Arcot.
	Total	889.00	32.0	
2 Cholam	Smut.	3,323.00 416.00 771.00 2,465.00		Salem. South Arcot. North Arcot. Coimbatore.
	Total	6,975.00	249.1	
3 Ragi	Blast	1,368.00 723.00 415.00 161.00 455.00		Coimbatore. Chingleput. Salem. North Arcot. South Arcot.
	Total	3,122.00	115.1	

APPENDIX 25—cont.

Particular of area covered by the control of crop diseases during the year 1960-61—cont.

NORTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crops.	Disease.	Area tackled. Ac/No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
4 Chillies	(a) Die back and Fruit rot.	605.00 226.00 1,272.00 47.00 34.00	TONS. 87.8	Salem. Chingleput. Coimbatore. South Arcot. North Arcot.
	Total	2,184.00		
	(b) Leafspot	9.00 124.00 18.040		North Arcot Salem. Chingleput.
	Total	317.00	RS. 47,550	
	(c) Damping off	629.00	94,350	Coimbatore.
5 Groundnut	Tikka leafspot.	746.00 120.00 1,221.00 41.00		Coimbatore. Salem. South Arcot. Chingleput.
	Total	2,128.00	1,06,400	
6 Banana	Leafspot	63.00 7.00 23.00		North Arcot. Chingleput. Coimbatore.
	Total	93.00	TONS. 93.00	
	(b) Wilt	16.00	16.00	Salem.
7 Citrus	(a) Die back and Canker.	491 4,345 2,286 1,057 1,600 540	RS.	Coimbatore. Salem. Chingleput. Nilgiris. South Arcot. North Arcot.
	Total	10,319	Nos. 2,0638	
	(b) Folioecellosis.	1,095 150 275 50		Salem. Chingleput. South Arcot. North Arcot.
	Total	1,570	Nos. 3,140	

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during the year 1960-61—cont.

NORTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crops.	Disease.	Area tackled Ac.No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
8 Onion	.. Left blight ..	180.00 5.00 47.00		Coimbatore. South Arcot. Salem.
	Total ..	241.00	TONS. 24.1	
9 Sugarcane	.. (a) Smut ..	580.00 375.00 2,127.00		Coimbatore. Salem. North Arcot.
	Total ..	3,082	RS. 3,26,560	
	b) Set rot ..	768.00 768.00 263.00 1,226.00 342.00 25.00		Coimbatore. South Arcot. Chingleput. North Arcot. Salem.
	Total ..	2,624.00	20,992	
10 Brinjal	.. (a) Virus ..	214.00	TONS. 21.4	North Arcot.
	(b) Leafspot ..	15.00	1.5	Chingleput.
11 Turmeric	.. Leafspot ..	520.00 242.00 13.00		Coimbatore. Salem. South Arcot.
	Total ..	775.00	RS. 1,16,250	
12 Acid lime	.. Canker ..	1,500 57		North Arcot. Coimbatore.
	Total ..	1,557 nos.	RS. 3,114	
13 Peas	.. (a) Powdery mildew.	121.00	TONS. 12.1	Nilgiris.
	(b) Downy mildew.	25.00	2.5	Nilgiris.
14 Cabbage	(a) Club Root	128.00	12.8	Nilgiris.
	(b) Leaf spot..	231.00 39.00		Salem. North Arcot.
	Total ..	270.00	27.0	

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during the year 1960-61—cont.

NORTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
15 Tea	.. (c) Mildew ..	5.00	TONS. 0.5	Salem.
	(a) Blister blight.	479.00	RS. 23,950	Nilgiris.
16 Coffee	.. Rust ..	368.00 24.00		Nilgiris. Salem.
	Total ..	392.00	RS. 19,600	
17 Coconut	.. (a) Stem bleed- ing.	431 686 135		Salem. North Arcot. Coimbatore.
	Total ..	1,302 nos.	RS. 2,604	
	(b) Leafspot	918 682 3,000 5,000		Coimbatore. Salem. South Arcot. Chingleput.
	Total ..	9,600 nos.	RS. 19,200	
18 Arecanut Wilt.	.. (c) Bud rot ..	2,400 nos. 1,838 1,186	RS. 4,800	South Arcot. Coimbatore. Salem.
	Total ..	2,994 nos.		Salem.
19 Grapes	.. Leafspot	437 nos.	RS. 9,475	Coimbatore.
	Downy mildew.	85.00 95.00		Salem. Coimbatore.
	Total ..	180.00	RS. 1,80,000	
	(b) Powdery mildew.	18.00 2.00		Salem. Coimbatore.
	Total ..	20.00		
20 Potato	.. (c) Anthracnose	2.00	RS. 2,000	Salem.
	(a) Early blight.	2,056.00	2,05,600	Nilgiris.
	(b) Virus ..	30.00	3,000	Nilgiris.

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during 1960-61—cont.

NORTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Diseases	Area tackled Ac./No.	Estimated gain in tons/rupees.		Districts.
(1)	(2)	(3)	(4)		(5)
21 Ginger	.. Rhizome rot		8.00	To save crop.	Nilgiris.
22 Chrysanthemum	.. Leafspot	..	2.00	Do.	Salem.
23 Cotton	.. Black Arm	..	5,744.00 964.00 8.00		Coimbatore. Salem. North Arcot.
	Total	..	6,716.00	RS. 3,35,800	
	(b) Wilt	..	12.00	600	Coimbatore.
	(c) Root rot	..	16.00	800	Do.
24 Bhonlai	.. Virus	..	2.00	To save crop.	Chingleput.
25 Tomato	.. Leaf blight	..	152.00 4.00 8.00		North Arcot. Nilgiris. Coimbatore.
	Total	..	164.00	TONS. 16.4	
26 Jasmine	.. Powdery mildew.		2.00	To save crop.	North Arcot.
27 Betelvine	.. (a) Wilt	..	329.00	RS. 82,250	Salem.
	(b) Powdery mildew.		1.00	250	Do.
28 Tobacco	.. (a) Frog eye leafspot.		176.00	17,600	Coimbatore.
	(b) Powdery mildew.		617.00	61,700	Do.
29 Mango	.. Powdery mildew.		207 2,155 580 428		North Arcot. Chingleput. South Arcot. Salem.
	Total	..	3,379 Nos.	RS. 6,740	
30 Plums	.. Powdery mildew.		50 Nos.	To save crop.	Nilgiris.

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during the year 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
Foodcrops— 1 Paddy	.. Blast	..	18.00 585.00 501.00 5,751.35 12.00 3,264.00 826.45	Pattukottai. Sattur. Nagercoil. Madurai. Mayuram. Palayamkottai. Tiruchirappalli (South). Sivaganga. Kumbakonam. Tiruchirappalli (North). Dindigul.
	Total	..	2,415.50 70.00 799.05 2,993.00	
			TONS. 615.55	
	Helminthosporiose.		371.55 718.00 1,205.50 1,246.00 1,193.50 2,321.50	Sivaganga. Nagercoil. Mayuram. Kumbakonam. Tiruchirappalli (South). Tiruchirappalli (North). Pattukottai. Thanjavur. Sankarankoil. Sattur.
	Total	..	14,472.80	TONS. 516.89
	Seed borne diseases.		1,209.00 9,592.00 7,451.00 5,758.00 2,735.00 9,584.00 8,164.00 7,060.00 9,292.00 6,550.00 3,370.00 6,878.00	Nagercoil. Dindigul. Madurai. Sattur. Sivaganga. Kumbakonam. Mayuram. Pattukottai. Thanjavur. Palayamkottai. Sankarankoil. Tiruchirappalli (South). Tiruchirappalli (North).
	Total	..	83,704.00	TONS. 2,989.3

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
	Pythum-rot ..	79.00	2.82	Thanjavur.
	Algal growth.	361.00		Do.
		2.00		Tiruchirappalli (North).
		41.00		Kumbakonam.
		47.00		Pattukottai.
	Total ..	451.00	16.11	
Total for paddy 1,15,342.15 acres and 4,140.80 tons.				
2 Ragi	.. Blast ..	104.00		Palayamkottai.
		62.00		Tiruchirappalli (South).
		73.25		Sivaganga.
		2105.00		Madurai.
		486.00		Sattur.
		8.00		Tiruchirappalli (North).
	Total ..	3,038.25	108.51	
3 Chola	.. Grainsmut ..	590.00		Madurai.
		1,814.00		Dindigul.
		1,775.00		Sattur.
		15.00		Tiruchirappalli (South).
	Total ..	4,194.00	149.81	
Grand total for Food crops .. 1,23,174.40 Acres and 4,309.12 Tons.				
Vegetables—				
Brinjal	.. Wilt	3.00		Mayuram.
	Fruit-rot ..	5.00		Kumbakonam.
	Dio-back ..	117.50		Nagercoil.
	Total for brinjal	125.50		
Cabbage	.. Leaf diseases ..	365.00		Madurai.
		30.00		Dindigul.
	Total ..	395.00		
Bendai	.. Mildew ..	8.00		Madurai.
Onion	.. Blight ..	1,242.00		Dindigul.
		485.00		Sattur.
	Total ..	1,727.00		

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	District.
(1)	(2)	(3)	(4)	(5)
Tomato	.. Leaf diseases ..	135.00		Dindigul.
		85.00		Madurai.
		3.00		Sivaganga.
	Total ..	223.00		
Yam	.. Alternaria ..	3.00		Kumbakonam.
Vegetables	.. Wilt	104.50		Nagercoil.
Banana	.. Do.	160.00		Dindigul.
		110.00		Sattur.
		5.00		Kumbakonam.
		0.15		Pattukkottai.
		22.00		Thanjavur.
		56.70		Palayamkottai.
	Total ..	353.85		
Banana	.. Leaf diseases ..	22.00		Kumbakonam.
	Bunchy-top ..	207.00		Nagercoil.
		350.00		Kumbakonam.
	Total ..	557.55		
	Total for Banana.	933.32		
	Total for vegetables.	3,644.88		
II. Other crops—				
(a) Commercial crops—				
(i) Sugarcane.	Smuts	141.75		Mayuram.
		450.00		Thanjavur.
		118.00		Tiruchirappalli (North).
		530.75		Tiruchirappalli (South).
	Total ..	1,240.50		
Do.	.. Set-rot ..	1,448.00		Dindigul.
		5.00		Sivaganga.
		52.00		Kumbakonam.
		10.00		Mayuram.
		538.00		Thanjavur.
		357.00		Tiruchirappalli (South).
	Total ..	2,410.00		
	Total for Sugar-cane.	3,650.50		

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during the year 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	District.
(1)	(2)	(3)	(4)	(5)
I. Other crops—cont.				
(ii) Cotton	Black-arm ..	7,311.00		Madurai.
		5,830.00		Sattur.
		279.00		Sivaganga.
		35.00		Mayuram.
		901.00		Palayamkottai.
		5,195.00		Sankarankoil.
		400.00		Tiruchirappalli (North).
	Total ..	19,951.00		
	Total for cotton ..	19,951.00	Acres.	
(iii) Tobacco	Frog eye spot ..	2.00		Mayuram.
	Black shank ..	37.50		Nagercoil.
	Damping off ..	0.25		Nagercoil.
		1.00		Pattukottai.
	Total ..	1.25	Acres.	
	Total for tobacco.	40.75		
	Total for Commercial Crops.	23,642.25	Acres.	
(b) Oil seeds—				
Groundnut	Tikka leaf spot.	43.00		Sattur.
		43.60		Sivaganga.
		70.00		Kumbakonam.
		55.00		Mayuram.
		15.00		Pattukottai.
		23.00		Thanjavur.
		533.00		Palayamkottai.
		250.00		Sankarankoil.
		44.00		Tiruchirappalli (North).
	Total ..	1,076.00		
	Seed borne disease.	100.00		Sivaganga.
		16.00		Sankarankoil.
	Total ..	116.00		
	Total for oil seeds.	1,193.60	Acres.	

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
(c) Others—				
1 Chillies	Fruit-rot and die-back.	215.50		Nagercoil.
		6,661.00		Dindigul.
		3,044.00		Madurai.
		4,995.00		Sattur.
		5,239.00		Sivaganga.
		123.00		Kumbakonam.
		75.00		Mayuram.
		228.00		Pattukottai.
		59.00		Thanjavur.
		3,450.00		Palayamkottai.
		2,550.00		Sankarankoil.
		2,370.00		Tiruchirappalli (North).
		265.50		Tiruchirappalli (South).
	Total ..	29,275.00		
Do.	Wilt ..	20.00		Kumbakonam.
		38.00		Thanjavur.
		17.00		Tiruchirappalli (North).
	Total ..	75.00		
Do.	Powdery mildew.	85.00		Sattur.
		20.00		Tiruchirappalli (North).
	Total ..	105.00		
	Total for chillies.	29,445.00	Acres.	
2 Potato	Early blight ..	1,243.00		Dindigul.
3 Betel-vine	Wilt ..	75.00		Kumbakonam.
		12.00		Palayamkottai.
	Total ..	87.00		
Betelvine	Mildew ..	122.00		Madurai.
		21.00		Tiruchirappalli (North).
	Total ..	143.00		
4 Ginger	Soft-rot ..	4.50		Nagercoil.
5 Grapevine	Downy mildew.	56.00		Dindigul.
		532.00		Madurai.
		275.00		Sattur.
		1.00		Sivaganga.
	Total ..	864.00		

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
(c) Others—cont.				
5 Grapevine ..	Powdery mil-dew.	356.00		Dindigul.
		578.00		Mayuram.
		82.00		Tiruchirappalli (North).
	Total ..	1,016.00		
Do. ..	Anthracnose.	0.50		Nagercoil.
	Total for Grapevine.	1,880.50 Acres.		
6 Cardamom ..	Leaf diseases.	1,080.00		Madurai.
7 Tea ..	Blister blight.	8,400.00		Madurai.
8 Rubber ..	Powdery mil-dew.	1,255.50		Nagercoil.
9 Coffee ..	Leaf rust ..	11,677.00		Nagercoil.
	Shooty mould.	0.15		Nagercoil.
	Total for Coffee	11,677.15 Acres.		
	Grand total for other crops.	83,705.35 ..		
	1 Vegetables.	3,044.88		
	2 Commercial crops.	23,642.25		
	3 Oil Seeds ..	1,192.60		
	4 Others ..	55,225.65		
	Total ..	83,705.38 Acres.		
III. Trees and plants—				
(a) Coconut trees alone—				
Coconut ..	Stem bleeding.	1,624		Nagercoil.
		1,200		Sivaganga.
		3,852		Kumbakonam.
		125		Mayuram.
		4,135		Pattukkottai.
		850		Thanjavur.
		3,150		Palayamkottai.
	Total ..	14,936 Acres.		

APPENDIX 25—cont.

Statement showing the diseases tackled and savings effected during the year 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop.	Disease.	Area tackled Ac./No.	Estimated gain in tons/ rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
(a) Coconut Trees alone—				
Coconut ..	Leaf diseases ..	18,987		Nagercoil.
		250		Dindigul.
		5,925		Sivaganga.
		3,160		Kumbakonam.
		670		Mayuram.
		200		Thanjavur.
		25		Tiruchirappalli (South).
	Total ..	29,217		
Do. ..	Bud-rot ..	853		Nagercoil.
		2		Sivaganga.
	Total ..	855		
Do. ..	Ganoderma ..	10		Kumbakonam.
		100		Sivaganga.
		85		Kumbakonam.
		357		Pattukkottai.
	Total ..	558		
	Total for coconut alone.	45,565	Nos.	
(b) Other fruit trees—				
Citrus ..	Canker and Die back.	321		Nagercoil.
		3,912		Dindigul.
		3,030		Madurai.
		9,005		Sattur.
		241		Sivaganga.
		1,979		Kumbakonam.
		2,210		Mayuram.
		145		Pattukkottai.
		486		Thanjavur.
		8,409		Palayamkottai.
		12,660		Sankarankoil.
		22,887		Tiruchirappalli (North).
				Tiruchirappalli (South).
	Total ..	9,229		
	Follicellosis ..	4,331		Nagercoil.
		140		Mayuram.
		1,570		Palayamkottai.
		650		Tiruchirappalli (North).
	Total ..	6,691		

APPENDIX 25—cont.

Particulars of area covered by the control of crop diseases during 1960-61—cont.

SOUTHERN DISTRICTS OF MADRAS STATE—cont.

Serial number and crop,	Disease.	Area tackled Ac.(No.	Estimated gain in tons. rupees.	Districts.
(1)	(2)	(3)	(4)	(5)
(b) Other fruit trees—cont.				
Citrus ..	Gummosis ..	..	600	Kumbakonam.
Do. ..	Powdery mildew.	..	3,340	Nagercoil.
			1,650	Tiruchirappalli (North).
	Total ..	..	4,990	
Mango ..				
	Total for citrus alone ..	..	86,795 Nos.	
	Mildew ..	..	6,515	Madurai.
			300	Kumbakonam.
			1,490	Mayuram.
			500	Sankarankoil.
	Total ..	..	9,405	
Do. ..	Die back. ..	..	2,803	Nagercoil.
			26	Mayuram.
			355	Pattukottai
			15	Thanjavur.
			45	Palayamkottai.
	Total ..	..	2,944	
Do. ..	Leaf blight ..	..	440	Sivaganga.
			350	Palayamkottai.
	Total ..	..	790	
Do. ..	Cracking of trunk.	..	995	Sattur.
	Total for mango ..	..	14,134 Nos.	
Do. ..	Fruit trees Die back.	..	12	Pattukottai.
Do. ..	Areanut Mahali	..	30,595	Nagercoil.
	Total for trees and plants ..	..	1,77,102 Nos.	

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61.

SOUTHERN REGION.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money value in rupees.
(1)	(2)	(3)	(4)	(5)	(6)
		ACS.	PER CENT.		RS.
Paddy—					
Shonobius incertulas W. (Stemborer).	Spraying Parathion at 1 oz. in 12½ gallons.	57,195.96	20	2,118	6,35,400
Nephotettix bipunctatus. F. (Green Jassids).	Dusting 5 per cent DDT.	24,660.40	20	913	2,73,900
Nephotettix bipunctatus and Thrips oryzae (Green Jassids and Thrips).	Dusting the mixture of DDT 5 per cent and BHC 10 per cent.	4,915.00	20	167	50,100
Nymphula depunctalis (Case worm).	Dusting 10 per cent BHC.	472.50	20	17.5	5,250
Nephotettix bipunctatus and Nilaparvata Lugens. (Green Jassids and Fulgorids).	Dusting 10 per cent BHC and 5 per cent DDT.	360.00	20	13.3	3,990
Hispa armigera (Rice hispa).	Dusting BHC 10 per cent.	103.50	20	3.9	2,790
Semilooper ..	Dusting DDT. ..	77.00	20	2.9	870
Leptocorisa acuta (Rice bug).	Dusting 10 per cent BHC.	10,540.00	20	390.4	1,17,120
Grass hopper ..	Do. ..	390.00	20	14.4	4,320
Cnaphalocerosis medialis G. (Leaf roller).	Do. ..	247.50	20	8.9	2,670
Thrips oryzae (Thrips).	Do. ..	1,243.70	20	34.6	10,977
Nilaparvata Lugens (Fulgorids).	Do. ..	17,099.00	20	633.3	1,80,990
Tettigoniella spectra D. (White Jassids).	Do. ..	3,677.75	20	135.8	40,740
Rat ..	Baiting with Zinc Phosphide.	22,308.50	5	826.2	2,47,860
Green Jassids and Thrips.	Dusting the mixture of 5 per cent DDT and 10 per cent BHC.	615.00	20	22.8	6,840
Ripensia oryzae Gr. (Mealy bug).	Spraying Parathion	16,545.00	20	612.8	1,83,840
Spodoptera mauritis B. (Army worm).	Spraying DDT ..	196.00	20	7.3	2,190
Pachidiplosis oryzae (gall fly).	Dusting 10 per cent BHC.	771.00	20	28.8	8,580
Green and White Jassids.	Dusting the mixture of 5 per cent DDT and 10 per cent BHC.	2,734.09	20	101.1	30,330

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

SOUTHERN REGION—cont.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money value in rupees.
(1)	(2)	(3) ACS.	(4) PER CENT.	(5)	(6) RS.
Paddy—cont.					
White jassids and Thrips.	Dusting the mixture of 5 per cent DDT and 10 per cent BHC.	8,131.00	20	30.1	9,030
Mealy bug and stem borer.	Spraying Parathion.	30.00	20	1.1	330
Army worm and Jassids.	Dusting DDT ..	640.00	20	23.7	8,110
Mites	Spraying Parathion.	315.00	20	11.7	3,510
Millets—					
Cholam—					
Chilo zonellus S. (Shoot borer).	Spraying BHC. ..	2,529.00	20	93.7	20,614
Calocoris angustatus and Tetranychus spp. (Ear head bug and Mite.)	Dusting the mixture of 10 per cent BHC and Sulphur.	510.00	20	18.9	4,158
Calocoris angustatus (Ear head bug).	Dusting the 10 per cent BHC.	4,188.50	20	155.2	34,144
Tetranychus spp. (Mite).	Dusting Sulphur ..	1,938.50	20	71.8	15,796
Grass hopper ..	Dusting 10 per cent BHC.	90.00	20	3.3	726
Ragi—					
Calocoris angustatus (Ear head bug).	Dusting 10 per cent BHC.	1,015.00	20	37.6	8,272
Laphygma exigua Hb. (Cut worm).	Dusting 5 per cent DDT.	110.00	20	4.0	880
Helio thrips indus (Thrips).	Dusting BHC 10 per cent.	193.00	20	7.1	1,562
Chaetocnema spp. (Flea beetle).	Dusting BHC 10 per cent.	666.00	20	24.7	5,434
Stemborer	Spraying BHC ..	374.00	20	13.9	3,058
Vegetables—					
Brinjal—					
Phenacoccus insolitus (Mealy bug).	Spraying parathion.	27.90	20	3.1	868
Tingied bug	Spraying parathion.	2.00	20	0.22	62
Rat	Baiting with zinc Phosphide.	7.00	5	0.80	224
Leucinodes Orbonalis (Fruit borer.)	Spraying DDT ..	294.00	20	33.00	2,240
Epilachna beetle ..	Dusting with calcium arsenate plus lime at 1:4 ratio.	5,128.00	20	569.9	1,59,320

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

SOUTHERN REGION.—cont.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money value in rupees.
(1)	(2)	(3) ACS.	(4) PER CENT.	(5)	(6) RS.
Vegetables—cont.					
Brinjal—cont.					
Jassids	Dusting 5 per cent DDT.	2.00	20	0.22	62
Aphids	Dusting Lindane ..	78.00	20	8.7	2,436
Leucinodes or bondi (Shoot borer.)	Spraying DDT ..	76.00	20	8.4	2,352
Epilachna and fruit borer.	Do.	222.00	20	24.6	6,888
Fruit and shoot borer.	Do.	210.55	20	23.4	6,552
Mealy bug, fruit borer and Epilachna.	Spraying Parathion.	25.00	20	2.8	784
Mite	Do.	20.00	20	2.2	616
Cucurbits—					
Aulocophora	Dusting lindane ..	158.00	20	17.6	4,928
Aphids	Do.	5.00	20	0.6	168
Semilooper	Dusting Calcium arsenate plus lime at 1:4 ratio.	33.00	20	3.7	1,036
Potato—					
Cut worm	Dusting DDT ..	290.00	20	72.5	20,300
Tubermoth	Spraying Parathion.	360.00	20	90.00	25,200
Onion—					
Thrips—Thrips tabacui	Spraying Lindane ..	1,683.00	20	186	32,840
Lab-lab—					
Aphids	Dusting Lindane ..	50.50	20	5.7	1,596
Tomato—					
Heliothes armejera (Fruit borer).	Spraying DDT ..	201.00	20	22.3	6,244
Cabbage—					
Cut worm	Spraying DDT ..	233.00	20	26	7,280
Cut worm and Aphids	Spraying Parathion.	1,041.00	20	115.7	32,396
Semi looper	Spraying DDT ..	33,94.00	20	437.1	1,22,388
Bendai—					
Aphids	Dusting Lindane ..	48.50	20	5.4	1,512
Jassids	Dusting DDT ..	20.00	20	2.2	616
Mites	Dusting sulphur ..	51.00	20	5.7	1,596
Shoot and fruit borer.	Spraying DDT. ..	101.40	20	11.3	3,164
Fruit borer	Do. ..	133.00	20	14.8	4,144

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

SOUTHERN REGION—cont.

Crop and pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money value in rupees.
(1)	(2)	(3)	(4)	(5)	(6)
		ACS.	PER CENT.		RS.
Vegetables—cont.					
Cluster beans—					
Aphids	Dusting Lindane ..	5.00	20	0.6	168
Tapiooa—					
Rats	Baiting with Zinc Phosphide.	55.00	5	..	..
Betelvino shade crop—					
Agathi—					
Prodena	Spraying DDT ..	136.00	20	..	..
Stemborer	Do. ..	21.00	20	..	..
Weevil	Do. ..	33.00	20	..	..
Condiments—					
Chillies—					
Scirtothrips dorsalis (H).	Spraying BHC ..	20,411.70	20	..	20,41,170
Orodenia lptura F. and Heliothis armigera (Fruit borer).	Spraying DDT ..	1,930.00	20	..	1,93,000
Aphids	Spraying BHC ..	10.00	20	..	1,000
Aphids and cutworms.	Spraying Parathion.	30.00	20	..	3,000
Fruit borer and Thrips.	Spraying DDT. ..	2,215.00	20	..	2,11,500
Oilseeds—					
Groundnut—					
Stomopteryx nortoria.	Dusting DDT. ..	5,711.00	20	..	2,85,550
Aphids	Dusting BHC. ..	146.00	20	..	7,300
Red Hairy Caterpillar (Amsacta albistriga M).	Dusting BHC and Spraying Parathion.	16,972.00	20	..	2,08,600
Rat	Baiting with zinc phosphide.	112.00	5	..	5,600
Gingelly—					
Shoot webber Antigastra.	Spraying BHC. ..	362.00	5	..	18,100
Castor—					
Semilooper Janata.	Achooa Spraying Endrin ..	16.00	5	..	..

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

SOUTHERN REGION—cont.

Crop and Pest.	Control measures adopted.	Area tackled.	Percentage of infestation.	Quantity saved in tons.	Money value in rupees.
(1)	(2)	(3)	(4)	(5)	(6)
		ACS.	PER CENT.		RS.
Oil seeds.—					
Coconut—					
Cryptos rhinoceros L. (Rhinoceros beetles).	Extraction of the beetles and apply 10 per cent BHC mixed with equal parts of sand.	61,475.00	5	..	1,22,950
Nephantis Serinopa (Black headed caterpillar).	Spraying DDT. or releasing specific para sites.	21,998.00	5	..	63,996
(Red palm weevil) ..	Application of 10 per cent Pyro-cone.	3,183	5	..	6,366
Scales	Spraying Parathion.	350	5	..	700
Mealy bugs	Do. ..	5,650	5	..	11,300
Termites	Do. ..	2,055.00	5	..	4,110
Spices—					
Cardamom—					
Thrips	Spraying BHC ..	2,062.00	5	..	..
Drugs and Narcotics—					
Tobacco—					
Prodenia litura (Cut-worm).	Spraying Parathion.	90.50	5	..	4,025
Shoot borer	Do. ..	25.00	5	..	1,250
Betelvino—					
Scale, and mites ..	Spraying Parathion.	15.00	5	..	1,500
Scales (Lepidasphe spp).	Do. ..	3.00	5	..	300
Fibre—					
Cotton—Boll worm (Earias spp).	Spraying Parathion.	346.00	5	..	3,400
Aphids, Jaasids and boll worm.	Do. ..	880.00	20	..	88,000
Stem weevil (Pemp-heres affris).	Adoption of mechanical methods.	70.00	20	..	7,000
Boll worms, Mites, Thrips and Aphids Earias spp. Mitos, Thripstabaai and A gossypii.	Spraying parathion.	114.00	20	..	11,400

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

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.
Fibre—cont.					
Cotton—cont.					
Boll worm, jassids and Aphids (Aphids gossypii).	Spraying Parathion.	1,790.00	20	..	2,21,000
Jassids, Aphids and Thrips.	Do. ..	980.00	20	..	98,000
Leaf roller <i>Sylepta derogata</i> .	Do. ..	50.00	20	..	5,000
Jassids (<i>Elnpoasca devastans</i>).	Do. ..	1,227.00	20	..	1,22,700
Aphids and Jassids ..	Do. ..	184.00	20	..	18,400
Thrips	Do. ..	150.00	20	..	15,000
Mite	Do. ..	188.00	20	..	18,800
Aphids and bollworm.	Do. ..	290.00	20	..	29,000
Mealy bug	Do. ..	162.00	20	..	16,200
Sugars—					
Sugarcane—					
(<i>Argyria sticticraspis</i>) Early shoot borer.	Spraying DDT ..	2,615.00	20	7,845	2,35,360
<i>Pyrilla perpusilla</i> <i>Pyrilla</i> Leaf Hopper.	Dusting BHC 10 per cent.	419.00	20	1,257	37,710
<i>Torinites</i>	Application of 10 per cent BHC	345.00	20	1,035	31,050
Top shoot borer ..	Adoption of Mechanical methods.	50.00	20	150	4,500
Mealy bug	Spraying Parathion.	22.00	20	66	1,980
Fruit trees—					
Mango—					
Mealy bug <i>Phenococcus</i> spp).	Spraying Parathion.	204.00	20	..	408
Woolly (Cryptorhynchus mangiteras).	Spraying DDT ..	32.00	20	..	64
Leaf webber (<i>Orthogona exvinacea</i>).	Spraying BHC 10 per cent.	3,097.00	20	..	6,194
Hopper (<i>Idiococcus</i> spp).	Spraying DDT ..	8,443.00	20	..	16,886
Citrus—					
Mite	Spraying Parathion.	5,084.00	20	..	10,168
Aphids (<i>Toxoptera</i> sp).	Spraying BHC ..	2,180.00	20	..	4,360
Leaf eating caterpillar (<i>Papilio demolous</i>).	Do. ..	8,205.00	20	..	16,410
Leaf miner (<i>Phyllocnistis citrella</i>).	Do. ..	1,853.00	20	..	3,706

APPENDIX 25—cont.

Statement showing the pests of crops tackled and savings effected during the year 1960-61—cont.

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.
Aphids and leaf miner.	Spraying BHC. ..	990.00	20	..	1,980
Mites, leaf miner Mealy bug, and Aphids.	Spraying Parathion.	5,708.00	20	..	11,416
Guva—					
Mealy bug	Do. ..	1,000.00	20	..	2,000
Apple—					
Woolly aphids (<i>Eriosoma lanigera</i>).	Do. ..	170.00	20	..	340
Cashew—					
Leaf roller	Spraying BHC. ..	280.00	20	..	560
Bud worm	Do. ..	600	20	..	1,200
Beverages—					
Coffee—					
Green bug (<i>Lecanium viride</i>).	Spraying Parathion.	1,775.00	20	..	1,77,500

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APPENDIX 26.

List of sugar factories in the Madras State which manufactured white sugar during 1960-61 season.

Name of the factory.	Location.	District.	Average daily crushing capacity in tons.	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	200	3,92,151-25	34,117-71
2 Thiru Arooran Sugars, Limited.	Vadapathimangalam	Thanjavur district	2,400	111	1,13,729-96	10,185-00
3 Deccan Sugars and Abkari Company, Limited.	Pugalur	Tiruchirappalli district.	1,200	273	2,52,409-82	23,813-60
4 Madurai Sugars and Allied Products, Limited.	Pandiyarajapuram	Madurai district	1,000	291	76,029-00	6,728-85
5 Cauvery Sugars and Chemicals, Limited.	Pettaivaithalai (Kulithalai taluk).	Tiruchirappalli district.	800	290	2,05,386-38	18,691-40
6 The Amaravathy Co-operative Sugar Mills, Limited.	A. K. Puthur Post	Coimbatore district	1,000	194	1,24,695-87	11,879-22
7 The North Arcot District Co-operative Sugar Mills, Limited.	Vadepudupet	North Arcot district	800	172	1,41,688-06	13,293-06
8 The Madurantakam Co-operative Sugar Mills, Limited.	Padalam	Chingleput district	1,000	48	79,473-55	5,571-99

APPENDIX 27.

Statement showing the Districtwar production and distribution of compost manure by municipalities during 1960-61.

District.	Production. (TONS)	Distribution. (TONS)
(1)	(2)	(3)
Chingleput	11,831	12,588
South Arcot	18,013	17,968
North Arcot	23,029	18,641
Thanjavur	31,039	25,295
Tiruchirappalli	36,210	41,863
Salem	34,864	31,618
Coimbatore	54,819	42,749
The Nilgiris	5,833	4,288
Madurai	91,419	79,065
Ramanathapuram	25,061	22,143
Tirunelveli	22,057	20,270
Kanyakumari	2,270	1,553
Corporation of Madras	11,581	10,589
Total	367,256	328,630

APPENDIX 28.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961.

Name of the post.	Period		Name of Officer-in-charge.
(1)	From	To	(4)
(2)	(3)		
MADRAS CITY.			
Director of Agriculture.	1 July 1960. 17 Nov. 1960.	16 Nov. 1960. 30 June 1961.	Sri A. Venkatesan, I.A.S. ,, V. Karthikeyan, I.A.S.
Joint Director of Agriculture (Planning and Development).	Throughout.		,, C. R. Seshadri.
Joint Director of Agriculture (State Seed Farm).	Do.		,, Md. Obeidullah Shah.
Joint Director of Agriculture (Inspection and General).	1 July 1960. 7 Mar. 1961.	28 Feb. 1961. 30 Mar. 1961.	,, S. M. Sulaiman. ,, P. P. Syed Mohamed, (in-charge).
	31 Mar. 1961.	30 June 1961.	,, T. K. Thangavelu.
Joint Director of Agriculture (Extension).	1 July 1960.	28 July 1960.	,, S. M. Sulaiman (in-charge).
	29 July 1960. 31 Mar. 1961.	30 Mar. 1961. 5 Apr. 1961.	,, P. P. Syed Mohamed. ,, T. K. Thangavelu (in-charge).
	6 Apr. 1961.	30 June 1961.	,, T. Natarajan.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the officer in-charge.
	From	To	
(1)	(2)	(3)	(4)
MADRAS CITY—cont.			
Joint Director of Agricultural (Engineering).	1 July 1960.	10 July 1961.	Sri R. M. Chidambaram (in-charge).
	11 July 1960.	30 June 1961.	„ N. Sankaranarayana Reddy.
Agricultural Engineer.	1 July 1960.	14 April 1961.	„ K. Natarajan.
	15 Apr. 1961.	30 June 1961.	„ K. Natarajan. (in-charge).
Deputy Director (Drilling).	1 May 1961.	30 June 1961.	„ S. E. Anantharam.
	1 June 1960.	30 June 1961.	„ R. M. Chidambaram.
Personal Assistant to the Director of Agriculture.	Throughout.		„ K. S. Narasimha Mudaliar.
Accounts Officer ..	Do.		„ K. T. Karunakaran.
Administrative Officer.	1 July 1960.	10 Apr. 1961.	„ A. Kitchanan.
	11 Apr. 1961.	16 Apr. 1961.	Vacant.
Do.	17 Apr. 1961.	30 June 1961.	„ S. Arunachalam.
	1 July 1960.	5 Nov. 1960.	„ V. Krishnamurthy.
	6 Nov. 1960.	13 Nov. 1960.	Gazetted Assistant (in-charge).
	14 Nov. 1960.	26 Nov. 1960.	Sri V. Krishnamurthy.
	27 Nov. 1960.	4 Apr. 1961.	„ C. V. Nagarajan.
	5 Apr. 1961.	14 Apr. 1961.	Vacant.
	15 Apr. 1961.	31 Apr. 1961.	Gazetted Assistant (in-charge).
	1 May 1961.	30 June 1961.	Sri C. V. Nagarajan.
Junior Accounts Officer.	1 July 1960.	1 Mar. 1961.	„ G. Ramachandran.
	2 Mar. 1961.	30 May 1961.	Accounts Officer (in-charge).
	31 May 1961.	8 June 1961.	Sri G. Ramachandran.
	9 June 1961.	30 June 1961.	„ O. P. Selvaraj.
Junior Accounts Officer (Soil Conservation).	1 July 1960.	30 June 1961.	„ S. Veerabahu.
Gazetted Assistant.	1 July 1960.	17 July 1960.	„ C. R. Seshadri (in-charge).
	18 July 1960.	30 June 1961.	„ K. Narayan Nayar.
Chief Inspector of Fertilizers.	1 July 1960.	31 Jan. 1961.	„ S. Muthuswamy Iyer.
	1 Feb. 1961.	10 Feb. 1961.	„ K. Narayan Nair (in-charge).
	11 Feb. 1961.	30 June 1961.	„ A. Radhakrishna Reddy.
	1 July 1960.	26 July 1960.	„ M. J. David.
Agricultural Information Officer.	26 July 1960.	5 Oct. 1960.	„ V. Ramalingam (in-charge).
	6 Oct. 1960.	28 Mar. 1961.	„ V. Ramalingam.
	29 Mar. 1961.	30 June 1961.	„ M. J. David.
Campaign Officer	1 July 1960.	13 June 1960.	„ B. Sreenivasa Rao.
Assistant Marketing Officer (Propaganda and Publicity).	1 July 1960.	6 Nov. 1960.	„ V. G. Venkataramana Rao.
	7 Nov. 1960.	7 Dec. 1960.	„ W. S. Ramarathnam (in-charge).
	8 Dec. 1960.	30 June 1961.	„ V. G. Venkataramana Rao.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.

Name of post.	Period		Name of the Officer in-charge.
	From	To	
(1)	(2)	(3)	(4)
MADRAS CITY—cont.			
Assistant Marketing Officer (Regulated Markets).	Throughout.		Sri W. S. Ramarathnam.
Assistant Agricultural Engineer.	Do.		„ P. K. Radhakanth.
Assistant Agricultural Engineer (River Pumping.)	14 Dec. 1960.	30 June 1961. (New post).	„ M. P. Dhandapani.
Stock Verifier ..	Throughout.		„ R. Alagiriswamy.
State Marketing Officer.	1 July 1960.	30 June 1961.	„ D. Shanmugasundaram.
Assistant Marketing Officer (Survey).	Throughout.		„ P. N. Seetharaman.
Assistant Marketing Officer (Grading).	Do.		„ K. Sriraman.
Assistant Marketing Officer (Regional).	1 July 1960.	16 July 1960.	„ K. Narayanan Nair.
	17 July 1960.	25 Oct. 1960.	„ V. Nataraja Iyer.
	26 Oct. 1960.	28 Oct. 1960.	„ Sriraman (in-charge).
		29 Oct. 1960.	„ K. R. Narayanasamy.
	30 Oct. 1960.	16 Nov. 1960.	„ K. Sriraman (in-charge).
	17 Nov. 1960.	30 June 1961.	„ K. R. Narayanaswamy.
Compost Development Officer.	1 July 1960.	26 Aug. 1960.	„ T. Rajagopala Iyengar.
	27 Aug. 1960.	23 Sep. 1960.	„ S. Muthuswamy (in-charge).
	24 Sep. 1960.	15 Jan. 1961.	„ T. Rajagopala Iyengar.
	16 Jan. 1961.	15 Feb. 1961.	„ M. Obidullah Shah (in-charge).
	16 Feb. 1960.	30 June 1961.	„ E. G. Sivaswamy.
	26 July 1960.	30 June 1961. (New post).	„ C. D. Chockalingam.
Deputy Director of Agriculture.	1 July 1960.	14 June 1961.	„ M. Mukundan.
	15 June 1961.	22 June 1961.	„ E. G. Sivaswamy (in-charge).
	23 June 1961.	30 June 1961.	„ K. H. Subramania Iyer.
	1 July 1960.	4 Apr. 1961.	„ V. Venkatasubramaniam.
Seed Development Officer.	5 Jan. 1961.	28 Jan. 1961.	„ M. Mukundan (in-charge).
	29 Jan. 1961.	30 June 1961.	„ V. Venkatasubramaniam.
	1 July 1960.	9 Apr. 1961.	„ S. Ramaswamy.
Cane Development Officer.	10 Apr. 1961.	30 June 1961.	„ P. A. Krishnamurthy.
General Superintendent, Industrial Engineering Workshop.	1 July 1960.	12 Mar. 1961.	„ T. S. Palanivelu.
	15 Mar. 1961.	22 Mar. 1961.	Vacant.
	23 Mar. 1961.	30 Mar. 1961.	Sri R. M. Chidambaram (in-charge).
	31 Mar. 1961.	14 Apr. 1961.	„ T. S. Palanivelu.
	15 Apr. 1961.	30 June 1961.	„ K. Natarajan.
	Throughout.		„ C. D. Sivasankaran.
Assistant Director (Drilling).	Do.		„ N. Ganeshamurthy.
District Agricultural Officer.	1 July 1960.	4 July 1960.	„ C. A. Parangimalai.
Assistant Agricultural Engineer, M.B. shed.	5 July 1960.	30 June 1961.	„ S. Gonsalves.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

Name of post.	Period		Name of the officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Agricultural College and Research Institute, Coimbatore.</i>			
Dean	1 July 1960.	16 Oct. 1960.	Dr. S. Krishnamurthy.
	17 Oct. 1960.	27 Nov. 1960.	„ B. W. X. Ponnayya.
	28 Nov. 1960.	30 June 1961.	„ S. Krishnamurthy.
Associate Dean ..	1 July 1960.	21 July 1960.	„ A. Mariakulandai.
	22 Nov. 1960.	30 June 1961.	„ B. W. X. Ponnayya.
Agronomist and Associate.	1 July 1960.	2 Apr. 1961.	Sri T. Nataraajan.
Professor of Agronomy.	3 Apr. 1961.	30 June 1961.	„ S. Rajarathnam Chetty (in additional charge).
Lecturer in Agriculture.	1 July 1960.	5 Jan. 1961.	„ M. D. Prabhu.
	15 Apr. 1961.	30 June 1961.	„ G. Venkataramanan.
			„ M. D. Prabhu.
Additional Lecturer in Agriculture.	1 July 1960.	31 Mar. 1960.	„ G. Venkataraman.
	1 Sep. 1960.	11 Oct. 1960.	„ M. D. Prabhu (in-charge).
	12 Oct. 1960.	30 June 1961.	„ S. Lakshmanan.
Lecturer in Agricultural Economics.	1 July 1960.	20 July 1960.	„ M. Ramachandran (in-charge).
	21 July 1960.	30 June 1961.	„ V. Rajagopalan.
Additional Lecturer in Agricultural Economics.	1 July 1960.	27 Aug. 1960.	„ M. Ramachandran.
	28 Aug. 1960.	30 June 1960.	„ V. Rajagopalan, (in-charge).
Lecturer in Entomology-I.	Throughout.		„ K. R. Nagaraja Rao.
Lecturer in Entomology-II.	Do.		„ T. Santhanaraman.
Lecturer in Entomology-III.	1 July 1960.	12 Aug. 1960.	„ S. V. nagopal.
	13 Aug. 1960.	23 Sep. 1960.	„ S. Kanakara David.
	24 Sep. 1960.	30 June 1960.	„ T. R. Subramanian.
Lecturer in Mycology I	1 July 1960.	2 Aug. 1960.	Kumari C. K. Soumini Rajagopalan.
	1 Aug. 1960.	30 June 1961.	„ C. V. Govindaswamy.
Lecturer in Mycology II.	1 July 1960.	1 Jan. 1961.	Kumari A. P. Sarojini Damodaran.
	2 Jan. 1961.	31 Jan. 1961.	„ C. V. Govindaswamy (in-charge).
	1 Feb. 1961.	30 June 1961.	Kumari A. P. Sarojini Damodaran.
Lecturer in Chemistry I.	1 July 1960.	25 Mar. 1961.	Sri S. Varadarajan.
	26 Mar. 1961.	18 May 1961.	„ R. Soundararajan (in-charge).
	19 May 1961.	30 June 1961.	„ S. Varadarajan.
Lecturer in Chemistry-II.	Throughout.		„ N. M. Thyagarajan.
Lecturer in Chemistry-III.	1 July 1960.	22 July 1960.	„ S. Varadarajan (in-charge).
	23 July 1960.	24 Oct. 1960.	„ R. Soundarajan.
	25 Aug. 1960.	8 Nov. 1960.	„ Varadarajan (in-charge).
	9 Nov. 1960.	30 June 1961.	„ R. Soundarajan.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Agricultural College and Research Institute, Coimbatore—cont.</i>			
Systematic Botanist and Associate Professor of Botany.	Throughout.		Sri D. Daniel Sundara Raj.
Lecturer in Botany-I.	1 July 1960.	21 Apr. 1961.	Srinathi Girija Balasubramanian.
	22 Apr. 1961.	31 May 1961.	Sri J. Sakarama Rao (in-charge).
	1 June 1961.	30 June 1961.	Srinathi Girija Balasubramanian.
Lecturer in Botany-II.	Throughout.		Sri J. Sakarama Rao.
Lecturer in Animal Husbandry.	Do.		„ C. A. Gopalakrishnan.
Professor of Animal Husbandry.	Do.		„ S. Krishnaswamy.
Lecturer in Civil Engineering.	Do.		„ R. K. Sivasappan.
Lecturer in Mechanical Engineering.	Do.		„ K. T. Narayanan.
Professor of Agricultural Engineering.	1 July 1961.	22 Apr. 1961.	„ S. E. Anantharaman.
	23 Apr. 1961.	30 June 1961.	„ T. S. Palanivelu.
Lecturer in Horticulture.	Throughout.		„ S. Muthuswamy.
Administrative Officer.	Do.		„ R. Ratnam.
Junior Accounts Officer.	Do.		„ S. Narayanan.
<i>Post-Graduate Research Institute, Coimbatore.</i>			
Professor of Plant Pathology.	Throughout.		Dr. K. Ramakrishnan
Professor of Soil Science.	1 July 1960.	22 Mar. 1961.	Sri D. John Dorairaj (in-charge).
	23 Mar. 1961.	26 Mar. 1961.	Sri T. N. Ananthanarayanan (in-charge).
	27 Mar. 1961.	11 Apr. 1961.	„ D. John Dorairaj (in-charge).
	12 Apr. 1961.	13 Apr. 1961.	Dr. A. Mariakulandai (in-charge).
	14 Apr. 1961.	30 June 1961.	Sri D. John Dorairaj (in-charge).
Professor of Agronomy.	1 July 1960.	21 July 1960.	Dr. A. Mariakulandai (in-charge).
	22 July 1960.	30 June 1961.	„ A. Mariakulandai.
Professor of Plant Genetics.	1 July 1960.	21 July 1960.	„ B. W. X. Ponnayya.
	22 July 1960.	30 June 1961.	„ B. W. X. Ponnayya (in-charge).
Reader in Genetics ..	Throughout.		Sri V. S. Raman.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Post-Graduate Research Institute, Coimbatore—cont.</i>			
Reader in Entomology	1 July 1960.	13 Aug. 1960.	Dr. S. Kanakaraj David.
	13 Aug. 1960.	4 Dec. 1960.	Sri Muhamad Basheer.
	5 Dec. 1960.	12 Jan. 1961.	„ P. S. Narayanaswamy (in-charge).
	13 Jan. 1961.	30 June 1961.	„ Muhamad Basheer.
Reader in Soil Science.	1 July 1960.	22 Mar. 1961.	„ D. John Dorairaj.
	23 Mar. 1961.	26 Mar. 1961.	„ T. N. Ananthanarayanan (in charge).
	27 Mar. 1961.	11 Apr. 1961.	Sri D. John Dorairaj
	12 Apr. 1961.	13 Apr. 1961.	Dr. A. Mariakulandai (in-charge).
	14 Apr. 1961.	30 June 1961.	Sri D. John Dorairaj.
Reader in Horticulture.	Throughout.		„ V. N. Madhava Rao.
Professor of Horticulture.	Do.		Dr. S. Krishnamurthy (in-charge).
RESEARCH SECTIONS.			
<i>Agronomy Section.</i>			
Superintendent, Central Farm.	Throughout.		Sri V. Muthupurumal.
Additional Superintendent, Central Farm.	1 July 1960.	18 July 1960.	„ S. Rajarathnam Chetty.
	19 July 1960.	20 July 1960.	„ C. D. Chockalingam.
	21 July 1960.	30 June 1961.	„ S. Rajarathnam Chetty.
Agricultural Meteorologist.	Throughout.		„ C. Balasubramaniam.
<i>Paddy Section.</i>			
Paddy Specialist ..	1 July 1960.	16 Feb. 1961.	Sri A. Abdul Samad.
	17 Feb. 1961.	19 Mar. 1961.	„ S. G. Ayyadurai (in-charge).
	20 Mar. 1961.	30 June 1961.	„ A. Abdul Samad.
Assistant Specialist, Paddy	Throughout.		„ K. Rajagopalan
Assistant Specialist, Paddy (Seed Dormancy Scheme).	Do.		„ A. Shanmugasundaram.
Assistant Specialist, Paddy Peravurani.	Do.		„ S. T. Srinivasan.
Assistant Specialist, Thalainayar.	1 July 1960.	24 Feb. 1961.	„ V. Krishnaswamy.
	25 Feb. 1961.	20 Mar. 1961.	„ K. Santhanam (in-charge).
	21 Mar. 1961.	30 June 1961.	„ S. T. Srinivasan (in-charge).

APPENDIX 28—cont

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
RESEARCH SECTIONS—cont.			
<i>Cotton Section.</i>			
Cotton Specialist.	1 July 1960.	15 Aug. 1960.	Sri C. K. Ramachandran.
	16 Aug. 1960.	29 Aug. 1960.	„ N. G. Narayanan (in charge).
	30 Aug. 1960.	30 June 1961.	„ C. K. Ramachandran.
Assistant Cotton Specialist, Srivilliputhur.	1 July 1960.	21 July 1960.	„ S. Iyemperumal.
	22 June 1960.	30 June 1961.	„ P. V. Marappan.
Assistant Cotton Specialist, Karunganni (Koilpatti).	Throughout.		„ R. S. Annappan.
Assistant Cotton Specialist (K 2 and Co. 4), Koilpatti.	1 July 1960.	30 June 1961.	„ V. D. Guruswamy Rajah.
Assistant Cotton Specialist, Tiruppur.	Throughout.		„ R. Sambandam.
Certification Officer, Rajapalayam.	1 July 1960.	29 July 1960.	„ P. N. Krishnaswamy (in-charge).
	30 July 1960.	30 June 1961.	„ P. N. Krishnaswamy.
Gazetted Assistant, Rajapalayam.	1 July 1960.	29 July 1960.	„ P. N. Krishnaswamy.
	30 July 1961.	30 June 1961.	„ S. Iyemperumal.
<i>Millets and Pulses Section.</i>			
Millet and Pulses Specialist.	1 July 1960.	14 Nov. 1960.	Sri S. G. Ayyadurai.
	15 Nov. 1960.	5 Feb. 1961.	„ C. K. Ramachandran (in-charge).
	6 Feb. 1961.	30 June 1961.	„ V. Srinivasan.
Assistant Millet Specialist.	1 July 1960.	31 Aug. 1960.	„ A. Subramanian.
Polischo Lab. Lab. Scheme.	1 Sep. 1960.	4 Dec. 1960.	Sri S. G. Ayyadurai (in-charge).
	5 Dec. 1960.	20 Jan. 1961.	„ C. K. Ramachandran (in-charge).
	21 Jan. 1961.	1 Apr. 1961.	Kumari K. Meenakshi.
	2 Apr. 1961.	16 Apr. 1961.	Sri V. Srinivasan (in-charge).
	17 Apr. 1961.	30 June 1961.	Kumari K. Meenakshi (in-charge).
Assistant Millet Specialist, Sathyamangalam.	1 July. 1960.	31 May 1961.	Sri R. Veeraswami.
	1 June 1961.	30 June 1961.	„ L. Anavaradhan.
Assistant Millet Specialist, Koilpatti.	Throughout.		„ K. Divakaran.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the Officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
RESEARCH SECTIONS—cont.			
Oil Seeds Section.			
Oil seeds Specialist ..	1 July 1960.	14 Nov. 1960.	Sri S. G. Ayyadurai (in charge).
	15 Nov. 1960.	30 June 1961.	„ S. G. Ayyadurai.
Assistant Oil seeds Specialist, Pollachi.	1 July 1960.	23 July 1960.	„ V. Subbiah.
	24 July 1960.	31 Aug. 1960.	„ S. Varisai Mohamed.
	1 Sep. 1960.	4 Nov. 1960.	„ E. G. Sivaswamy (in-charge.)
	5 Nov. 1960.	30 June 1961.	„ A. N. Venkateswaran.
Assistant Oil Seeds Specialist, Karur.	Throughout.		„ N. Srinivasalu.
Assistant Oil Seeds Specialist, Salem.	Do.		„ N. R. Chandrasekaran.
Assistant Oil Seeds Specialist, Pattukottai.	Do.		„ P. A. Muhamad Ibrahim.
Assistant Oil Seeds Specialist, Koilpatti.	29 July 1960.	30 June 1961.	„ V. Subbiah.
	(New Post)		
Horticultural Section.			
Horticulturist and Associate Professor of Horticulture.	Throughout.		„ J. Samuel Sundara Raj.
Horticulturist, Periakulam.	Do.		„ R. Bettai Gowder.
Assistant Horticulturist (Vegetable Scheme), Coimbatore.	1 July 1960.	15 July 1960.	„ K. R. Raman.
	16 July 1960.	4 Aug. 1960.	„ S. Muthuswamy (in charge).
	5 Aug. 1960.	10 June 1961.	„ K. R. Raman.
	11 June 1961.	25 June 1961.	„ S. Muthuswamy (in-charge).
	26 June 1961.	30 June 1961.	„ K. R. Raman.
Assistant Horticulturist, Fruit Development Scheme, Coimbatore.	Throughout.		„ T. M. Venkatram.
Banana Research Officer, Aduturai.	Do.		„ C. M. Bakthavathsalu
Cashew Development Officer, Thanjavur.	Do.		„ B. S. Kuppuswamy.
Assistant Horticulturist, Coonoor.	1 July 1960.	27 July 1960.	„ K. R. Kuppuswamy.
	28 July 1960.	1 Nov. 1960.	J. Samuel Sundararaj (in-charge).
	2 Nov. 1960.	30 June 1961.	M. C. Appayyan.
Assistant Horticulturist, Ooty.	28 July 1960.	30 June 1961.	„ K. P. Kuppuswamy.
	(New Post)		
Assistant Horticulturist, Kanyakumari.	Throughout.		„ N. Raghavan.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

1st July 1960 to 30th June 1961

Name of the post.	Period		Name of the Officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
RESEARCH SECTIONS—cont.			
Horticultural Section—cont.			
Assistant Horticulturist, Attur (Salem).	2 Nov. 1960.	30 June 1961.	Sri P. V. Rajappan.
	(New Post)		
Assistant Horticulturist, Apples Scheme, Kodaikanal.	16 March 1961.	30 June 1961.	„ K. V. Raman.
	(New Post)		
Botany Section.			
Plant Physiologist, Coimbatore.	1 July 1960.	23 Aug. 1960.	Sri S. Gopalakrishnan (in-charge).
	24 Aug. 1960.	30 June 1961.	„ Kumari Vinodhini Vasudevan.
Plant Physiologist, (Myco), Coimbatore.	24 March 1961.	30 June 1961.	„ S. S. Nagarajan.
	(New Post)		
Cytogeneticist, Coimbatore, (Fodder Scheme).	1 July 1960.	9 July 1960.	Srimathi Girija Balasubramanyan (in-charge).
	10 July 1960.	17 Aug. 1960.	Sri P. Chandrasekaran.
	18 Aug. 1960.	6 Sep. 1960.	Srimathi Girija Balasubramanian (in-charge).
	7 Sep. 1960.	30 June 1961.	Sri P. Chandrasekaran.
Cytogeneticist, Coimbatore.	1 July 1960.	21 Oct. 1960.	„ V. S. Raman (in-charge).
	22 Oct. 1960.	30 June 1961.	„ G. Thulasidoss.
Fodder Research Officer, Coimbatore.	1 July 1960.	17 Aug. 1960.	„ S. Madhava Rao.
	18 Aug. 1960.	30 June 1961.	Srimathi Sunanda Sakarama Rao.
Groundnut Physiologist, Coimbatore.	Throughout.		Sri S. Gopalakrishnan.
Algologist, Coimbatore.	1 July 1960.	16 July 1960.	Kumari A. P. Sarojini Damodaran (in-charge).
	17 July 1960.	30 June 1961.	Sri V. Ramakrishnan.
Sugarcane Section.			
Sugarcane Specialist, Cuddalore.	1 July 1960.	7 Aug. 1960.	Sri C. Ekambaram.
	8 Aug. 1960.	14 Apr. 1961.	„ V. K. Appaji.
	15 Apr. 1961.	30 June 1960.	„ C. Ekambaram.
Assistant Agricultural chemist, Cuddalore.	1 July 1960.	22 Sep. 1960.	„ T. S. Govindan (in-charge).
	23 Sep. 1960.	30 Sep. 1960.	„ J. Vaithinathan (in-charge).
	1 Oct. 1960.	30 June 1960.	„ T. Radhakrishnan.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.

Name of post.	Period		Name of the officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
RESEARCH SECTIONS—cont.			
<i>Sugarcane Section—cont.</i>			
Assistant Agronomist, Cuddalore.	1 July 1960.	19 July 1960.	Sri C. Ekambaram (in-charge).
	20 July 1960.	11 Aug. 1960.	„ Solomon Durairaj
	12 Aug. 1960.	5 Jan. 1961.	„ J. Vaidyanathan.
	6 Jan. 1961.	30 June 1961.	„ P. S. Sanjeevi.
Assistant Mycologist, Cuddalore.	22 Mar. 1961.	30 June 1961.	„ N. Jaleel Ahmed.
(New Post)			
Assistant Agronomist, Rajathanikottai.	1 July 1960.	4 Aug. 1960.	„ J. Vaithinathan.
	5 Aug. 1960.	18 Aug. 1960.	„ A. E. David (in-charge).
	19 Aug. 1960.	30 June 1961.	„ Solomon Dorairaj.
Assistant Agronomist, Lakshmgudi.	Throughout.		„ T. D. Muthuswamy.
Assistant Agronomist, Sirukamani.	1 July 1960.	10 July 1960.	„ K. R. Sundaresan.
	11 July 1960.	23 July 1960.	„ K. M. Vijayan (in-charge).
	24 July 1960.	10 April 1961.	„ K. R. Sundaresan.
	11 April 1961.	30 June 1961.	„ J. Vaithinathan.
Assistant Agronomist, Gudiyatham.	13 July 1960.	30 June 1961.	„ S. Vaithinathan.
(New Post)			
<i>Chemistry Section.</i>			
Agricultural Chemist and Associate Professor of Soil science.	1 July 1960.	9 Apr. 1961.	Sri T. N. Ananthanarayan.
	10th April 1961.	30 June 1961.	„ F. L. Daniel.
Agricultural Bacteriologist.	Throughout.		„ K. Sivasankaran Nair.
Assistant Agricultural Chemist (Phosphate).	1st July 1960.	31st August 1960.	„ C. R. Venkataraman.
	1st Sept. 1960.	4th Dec. 1960.	„ K. Vasudeva Menon (in-charge).
	5th Dec. 1960.	30th June 1961.	„ S. R. Thyagarajan.
Assistant Agricultural Chemist (Groundnut Storage).	1 July 1960.	4th Dec. 1960.	Srimathi Indira Rajah.
	5th Dec. 1960.	30 June 1961.	Sri C. N. Venkataraman.
Assistant Agricultural Chemist (Blast resistant Scheme).	Throughout.		„ C. P. Natarajan.
Assistant Agricultural Chemist (Green Manure Scheme).	Do.		„ K. Vasudeva Menon.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the officer-in-charge.
	From	To	
(1)	(2)	(3)	(4)
RESEARCH SECTIONS—cont.			
<i>Chemistry section—cont.</i>			
Assistant Agricultural Chemist (Saline and Alkaline).	1 July 1960.	9 April 1961.	Sri F. L. Daniel.
	10 Apr. 1961.	25 Apr. 1961.	„ F. L. Daniel (in-charge).
	26 Apr. 1961.	7 June 1961.	Kumari S. Malathi Devi.
Assistant Agricultural Chemist (Soil Survey).	8 June 1961.	30 June 1961.	Sri V. Ravi Kumar.
	1 July 1960.	29 Nov. 1960.	„ C. Rathnam.
	30 Nov. 1960.	5 Mar. 1961.	„ K. M. Krishna Menon.
	6 Mar. 1961.	23 Mar. 1961.	Kumari S. Malathi Devi.
Soil Survey Officer, Amaravathi Project.	24 Mar. 1961.	7 June 1961.	Sri V. Ravikumar.
	8 June 1961.	30 June 1961.	„ C. Rathnam.
	Throughout.		„ T. A. Govinda Iyer.
Assistant Agricultural Chemist, Parambikulam Project.	1 July 1960.	28 Sept. 1960.	„ N. M. Thyagarajan (in-charge).
Assistant Soil Chemist, Coimbatore.	27 Sept. 1960.	2 June 1961.	„ K. Sivarama Shetty.
	3 June 1961.	30 June 1961.	„ D. M. Samuel.
	Throughout.		„ S. Venkatachalam.
Assistant Soil Chemist, Aduthurai.	Do.		„ C. K. Rajagopalan.
Assistant Agricultural Chemist (Mad. of Phos. Potential.)	30 Oct. 1960.	2 June 1961.	Srimathi Indra Raja.
	3 June 1961.	30 June 1961.	Sri K. Sivarama Shetty.
<i>Entomology Section.</i>			
Entomologist and Associate Professor of Entomology.	Throughout.		Sri P. S. Narayanasamy.
Assistant Entomologist (Sugarcane Bat Scheme.)	1 July 1960.	30 Mar. 1961.	Srimathi A. Leela David.
	31 Mar. 1961.	..	Sri T. S. Muthukrishnan (Post transferred to Cuddalore).
Assistant Entomologist (Sugar cane Bat Scheme), Cuddalore.	6 Apr. 1961.	30 June 1961.	„ T. S. Muthukrishnan.
Assistant Entomologist (Taxicology).	1 July 1960.	5 Mar. 1961.	„ T. S. Muthukrishnan.
	6 Mar. 1961.	15 Mar. 1961.	„ P. S. Narayanaswamy (in-charge)
	16 Mar. 1961.	30 Mar. 1961.	„ T. S. Muthukrishnan.
	31 Mar. 1961.	30 June 1961.	Dr. S. Kanakraj David.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from 1st July 1960 to 30th June 1961—cont.

Name of post.	Period		Name of the Officer in-charge.
	From	To	
(1)	(2)	(3)	(4)
RESEARCH SECTIONS—cont.			
Entomology Section—cont.			
Assistant Entomologist (Vegetable) Coimbatore.	1 July 1960.	27 Jan. 1961.	Sri S. Venugopal.
	28 Jan. 1961.	14 Feb. 1961.	„ P. S. Narayanaswamy (in-charge).
	15 Feb. 1961.	30 Mar. 1961.	„ S. Venugopal.
	31 Mar. 1961.	30 June 1961.	Srimathi A. Leela David.
Crop and Plant Protection Officer (Entomology), Coimbatore.	1 July 1960.	1 Dec. 1960.	Sri K. R. Nagarajan.
	2 Dec. 1960.	22 Dec. 1960.	„ K. C. Chandy.
	23 Dec. 1960.	30 Mar. 1961.	Dr. Kanakaraj David.
	31 Mar. 1961.	30 June 1961.	Sri S. Venugopal.
Assistant Entomologist (Paddy Stem Borer), Aduthurai.	Throughout.		„ P. R. Nagaraja Rao.
Crop and Plant Protection Officer (Entomology), Thanjavur.	Do.		„ E. V. Abraham.
Mycology Section.			
Mycologist and Associate Professor of Plant Pathology.	Throughout.		Sri M. Kandaswamy.
Crop and Plant Protection Officer (Mycology), Coimbatore.	1 July 1960.	12 Dec. 1960.	„ N. R. Adyanthayya.
	13 Dec. 1960.	22 Dec. 1960.	„ K. C. Chandy (in-charge).
	23 Dec. 1960.	19 Feb. 1961.	Dr. Kanakaraj David (in-charge).
	20 Feb. 1961.	30 Mar. 1961.	Sri A. Venkat Rao.
	1 Apr. 1961.	30 Apr. 1961.	„ N. R. Adyanthayya.
Assistant Mycologist (Vegetable).	1 July 1960.	16 Mar. 1961.	„ N. Jaleel Ahmed.
	17 Mar. 1961.	31 Mar. 1961.	„ A. Venkatrao (in-charge).
	1 Apr. 1961.	30 June 1961.	„ A. Venkatrao.
Crop and Plant Protection Officer, (Mycology), Madurai.	Throughout.		„ T. V. Subramaniam.
Assistant Mycologist Aduthurai.	Do.		„ C. S. Krishnamurthy.
Assistant Mycologist Blue green Algal Scheme.	1 July 1960.	2 Aug. 1960.	Kumari Soumini Rajagopalan (in-charge.)
	3 Aug. 1960.	30 June 1961.	Do.
Assistant Mycologist, Banana disease.	1 July 1960.	30 June 1961.	Sri K. M. Vijayan.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers 1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the Officer in charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Research Engineering Section.</i>			
Research Engineer, Coimbatore.	Throughout.		Sri C. S. Sridharan.
Assistant Agricultural Engineer (Research), Coimbatore.	Do.		„ A. M. Mohamed Ali.
<i>Extension section.</i>			
Extension Specialist.	Throughout.		Sri A. H. Subramanya Sarma.
Assistant Extension Specialist I.	Do.		„ M. K. Lingiah.
Assistant Extension Specialist II.	Do.		„ N. Ranganathachari.
Assistant Extension Specialist III.	1 July 1960.	24 July 1960.	„ N. Ranganathachari (in-charge.)
	25 July 1960.	14 Oct. 1960.	„ S. Muthuswamy.
	15 Oct. 1960.	20 Oct. 1960.	„ M. K. Lingiah (in-charge.)
	21 Oct. 1960.	27 Jan. 1961.	„ S. Muthuswamy.
<i>(Post retrenched with effect from 27th January 1961 After noon).</i>			
Survey Officer, Coimbatore.	1 July 1960.	31 Aug. 1960.	Sri K. Kannian.
	1 Sep. 1960.	5 May 1961.	„ N. Ranganathachari (in-charge.)
	6 May 1961.	30 June 1961.	„ T. Arunachalam.
<i>Madras Division.</i>			
Deputy Director of Agriculture, Madras.	1 July 1960.	14 June 1960.	Sri M. Mukundan.
	15 June 1961.	22 June 1961.	„ E. G. Sivaswami (in-charge.)
	23 June 1961.	30 June 1961.	„ K. H. Subramany Iyer.
District Agricultural Officer, Guindy.	Throughout.		„ N. Ganesamurthy.
District Agricultural Officer, Chingleput.	1 July 1960.	6 July 1960.	Do.
	7 July 1960.	30 June 1960.	„ P. S. Anantha chari (in-charge.)
	1 July 1960.	3 Feb. 1961.	„ A. Radhakrishna Reddy.
District Agricultural Officer, Vellore.	1 July 1960.	5 Apr. 1961.	„ S. Muthuswamy.
	4 Feb. 1961.	30 June 1961.	„ V. Ramalingam.
	Throughout.		„ K. S. Kutty Mudaliar.
District Agricultural Officer, Polur.	1 July 1960.	8 June 1961.	„ S. Annaswamy.
District Agricultural Officer, Cuddalore.	2 June 1961.	11 June 1961.	„ M. S. Kolandaswamy (in-charge.)
	12 June 1961.	30 June 1961.	„ S. E. Kothandaraman.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers
1st July 1960 to 30th June 1961—cont.

Name of the post.	Period		Name of the Officer in-charge
	From	To	
(1)	(2)	(3)	(4)
<i>Madras Division—cont.</i>			
District Agricultural Officer, Villupuram.	Throughout.		Sri M. S. Kolandaswamy.
Superintendent, Agricultural Research Station, Tirurkappam.	1 July 1960.	26 June 1961.	„ K. Thandavarayan.
	27 June 1961.	30 June 1961.	Srimathi L. Dhanaraj.
Superintendent, Agricultural Research Station, Palur.	1 July 1960.	30 Oct. 1960.	Sri M. K. Venkatasubramaniam.
	31 Oct. 1960.	30 June 1961.	„ P. Madhava Menon.
Superintendent, Agricultural Research Station, Tindivanam.	Throughout.		„ P. Krishnaswamy.
Cane Development Officer, Madras.	1 July 1960.	9 Apr. 1961.	„ S. Ramaswamy.
	10 Apr. 1961.	30 June 1961.	„ P. A. Krishnamurthy.
Assistant Agricultural Engineer, M. B. Shed, Saidapet.	1 July 1960.	4 July 1960.	Sri C.A. Parangusadoss.
	5 July 1960.	30 June 1961.	„ S. Gansalves.
Assistant Agricultural Engineer (Inspection), Vellore.	1 July 1960.	7 June 1961.	„ S. E. Kothandaraman.
	8 June 1961.	30 June 1961.	„ R. Kuppuraj.
Assistant Agricultural Engineer, Cuddalore.	Throughout.		P. G. Gopalan.
Assistant Agricultural Engineer, Soil Conservation, Vellore.	Do.		„ R. Viswanathan.
Assistant Agricultural Engineer, Soil Conservation, Panruti.	Do.		„ S. Savadamuthu.
Assistant Agricultural Engineer, Soil Conservation, Cuddalore.	20 Jan. 1961.	25 May 1961.	Do.
	(New Post).		
	26 May 1961.	30 June 1961.	„ Alfred William.
Assistant Director (Drilling), Chidambaram.	1 July 1960.	28 Oct. 1961.	„ J. Krishnamurthy.
	29 Oct. 1960.	30 June 1961.	„ K. Gopalakrishnan.
Seed Development Officer, Madras.	1 July 1960.	4 Jan. 1961.	„ V. Venkatasubramanian.
	5 Jan. 1961.	23 Jan. 1961.	„ M. Mukundan (in-charge.)
	29 Jan. 1961.	30 June 1961.	„ V. Venkatasubramanian.

APPENDIX 28—cont.

Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.

Name of the post.	Period.		Name of the officer (in charge).
	From	To	
(1)	(2)	(3)	(4)
<i>Thanjavur Division.</i>			
Joint Director of Agriculture (Package Programme), Thanjavur.	Throughout.		„ T.S. Francis.
Deputy Director of Agriculture.	Do.		„ K. Santhanam.
Plant Protection Specialist, Thanjavur.	5 Dec. 1960.	30 June 1961. (New Post).	„ K.R. Nagarajan.
Assistant Agricultural Engineer, Thanjavur.	20 Jan. 1961.	30 June 1961. (New Post).	„ J. Soundarapandian.
District Agricultural Officer, Thanjavur.	Throughout.		„ T.P. Shanmuga Naynaar.
District Agricultural Officer, Kumbakonam.	Do.		„ R. Viswanathan.
District Agricultural Officer, Mayuram.	1 July 1960.	15 July 1960.	„ R. Viswanathan, (in charge).
	16 July 1960.	30 June 1961.	„ T.K. Ramachandran.
District Agricultural Officer, Pattukottai.	Throughout.		„ R. Shanmugasundaram.
District Agricultural Officer, Tiruchirappalli (South).	Do.		„ P. N. Muthuswamy.
District Agricultural Officer, Tiruchirappalli (North).	1 July 1960.	8 Dec. 1960.	„ G. Murugesan.
	9 Dec. 1960.	20 Dec. 1960.	„ P.N. Muthuswamy, (in charge).
	21 Dec. 1959.	30 June 1961.	„ R. Ramanathan.
Seed Development Officer, Thanjavur.	1 July 1960.	2 July 1960.	„ K. Santhanam, (in-charge).
	3 July 1960.	30 June 1961.	„ Herbert Adisesiah.
Assistant Marketing Officer, Tiruchirappalli.	1 July 1960.	30 June 1961.	„ V. Nataraja Iyer.
	1 July 1960.	30 June 1961.	„ S.V. Ramachandran.
Superintendent, Agricultural Research Station, Aduthurai.	1 July 1960.	31 Jan. 1961.	„ V. Srinivasan.
	1 Feb. 1961.	1 June 1961.	„ S. Manamohanlal.
	2 June 1961.	30 June 1961.	„ R. Veeraswamy.

APPENDIX 28—cont.

*Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.*

Name of the post.	Period.		Name of the officer in charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Thanjavur Division—cont.</i>			
Superintendent Agricultural Research Station, Pattukottai.	1 July 1960.	22 May 1961.	„ R. Krishnan.
	23 May 1961.	30 June 1961.	„ T. S. Theentharappan, (in charge.)
Assistant Agricultural Engineer (Inspection), Thiruchirappalli.	Throughout.		„ S. Subramaniam.
Assistant Agricultural Engineer (Soil Conservation) Thiruchirappalli.	Do.		„ T. R. Narasimhalu.
Cane Development Officer, Thiruchirappalli.	1 July 1960.	1 Sep. 1960.	„ T.N. Balasubramanian.
	2 Sep. 1960.	5 Oct. 1960.	„ K.R. Sundaresan, (in charge).
	6 Oct. 1960.	15 Jan. 1961.	„ C. Ekambaram.
	16 Jan. 1961.	28 Jan. 1961.	„ K.R. Sundaresan, (in charge).
	29 Jan. 1961.	9 April 1961.	„ C. Ekambaram.
	10 Apr. 1961.	30 June 1961.	„ K.R. Sundaresan.
<i>Madurai Division.</i>			
Deputy Director of Agriculture, Madurai.	1 July 1960.	22 July 1960.	„ K. Santhanam, (in charge).
	23 July 1960.	15 Mar. 1961.	„ C. Paman Mosad.
	16 Mar. 1961.	22 June 1961.	„ K. Santhanam, (in charge).
	23 June 1961.	30 June 1961.	„ M. Mukundan.
District Agricultural Officer, Madurai.	Throughout.		„ R. Subbiah Pillai.
Seed Development Officer, Madurai.	1 July 1960.	12 Apr. 1961.	„ K. C. Thomas.
	13 Apr. 1961.	13 June 1961.	„ R. Subbiah Pillai, (in charge).
	15 June 1961.	30 June 1961.	„ S. Annaswamy.
District Agricultural Officer, Dindigul.	Throughout.		„ B.P. Masilamani.
District Agricultural Officer, Sattur.	1 July 1960.	22 June 1961.	„ P. K. Sivasubramaniam.
	23 June 1961.	30 June 1961.	„ P.A. Murty, (in charge).
District Agricultural Officer, Sivaganga.	Throughout.		„ M. N. Meenakshi-sundaram.

APPENDIX 28—cont.

*Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.*

Name of the post.	Period.		Name of the Officer in charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Madurai Division—cont.</i>			
District Agricultural Officer, Tirunelveli, (Palayamkottai).	1 July 1960.	4 April 1961.	„ S. Ramachandran.
	5 Apr. 1961.	10 April 1961.	„ G. Venkatakrishnan, (in charge).
	11 Apr. 1961.	30 June 1961.	„ J.J.D. Edward.
District Agricultural Officer, Sankarankoil.	1 July 1960.	20 July 1960.	„ E. G. Sivaswami
	21 July 1960.	30 June 1961.	„ G. Venkatakrishnan.
District Agricultural Officer, Nagercoil.	Throughout.		„ K.M. Narayanan.
Assistant Marketing Officer, Madurai.	Do.		„ P. Gopalakrishnan.
Assistant Agricultural Engineer (Inspection), Madurai.	1 July 1960.	15 Mar. 1961.	„ P.A. Murthy.
	16 Mar. 1961.	30 June 1961.	„ R. Somalingam.
Assistant Agricultural Engineer (Inspection), Sattur.	16 Mar. 1961.	30 June 1961.	„ P.A. Murthy.
	(New Post).		
Assistant Agricultural Engineer (Inspection), Tirunelveli	Throughout.		„ K. Linganan.
Assistant Agricultural Engineer (Soil Conservation) Dindigul.	Do.		„ T. Sivasubramaniam.
Assistant Agricultural Engineer (Dry Farming) Batlagundu.	Do.		„ S.C. Nallagounder.
Assistant Agronomist (Black Soil) Koilpatti.	Do.		„ M.S. Sethuraman.
Superintendent, Agricultural Research Station, Koilpatti.	1 July 1960.	13 July 1960.	„ K. Diwakaran, (in charge).
	14 July 1960.	19 Feb. 1961.	„ A.K. Nagarathanam.
	20 Feb. 1961.	3 June 1961.	Do. (in charge).
	4 June 1961.	30 June 1961.	„ L. Sivagnanam.
Assistant Chillies Specialist, Koilpatti.	20 Feb. 1961.	30 June 1961.	„ A.K. Nagarathanam.
	(New Post).		

APPENDIX 28—cont.

*Appointments, postings and transfers of Gazetted officers from
1st July 1960 to 30th June 1961—cont.*

Name of the post.	Period.		Name of the Officer in charge.
	From	To	
(1)	(2)	(3)	(4)
Madurai Division—cont.			
Assistant Cotton Extension Officer, Madurai.	Throughout.		Sri A. Raghavan.
Coconut Development Officer, Ramanathapuram.	23 July 1960.	30 June 1961.	„ A.R. Visvamathan.
Coimbatore Division.			
Deputy Director of Agriculture, Coimbatore.	1 July 1960.	24 July 1960.	Sri P. P. Syed Mohamed.
	25 July 1960.	7 Feb. 1961.	„ E. G. Sivaswamy.
	1 Feb. 1961.	30 June 1961.	„ S. Muthuswamy Iyer.
Seed Development Officer, Coimbatore.	1 July 1960.	30 Nov. 1960.	„ T.S. Dakshinamurthy..
	1 Dec. 1960.	24 Dec. 1960.	„ E. G. Sivaswamy (in charge).
	25 Dec. 1960.	2 June 1961.	„ T. S. Dakshinamurthy.
	3 June 1961.	30 June 1961.	„ D. A. Syed Mohamed.
District Agricultural Officer, Coimbatore.	1 July 1960.	18 July 1960.	„ K. H. Subramanya Iyer.
	19 July 1960.	20 July 1961.	„ S. Rajarathnam Chetty.
	21 July 1960.	3 Mar. 1961.	„ K. H. Subramanya Iyer.
	4 Mar. 1961.	2 June 1961.	„ T.S. Dakshinamurthy.
	3 June 1960.	8 June 1961.	„ D. A. Syed Mohamud (in charge).
	9 June 1961.	30 June 1961.	„ U. V. Thyagaram.
District Agricultural Officer, Erode.	1 July 1960.	27 Apr. 1961.	„ T. Arunachalam.
	28 Apr. 1961.	30 June 1961.	„ S. Muthuswamy.
District Agricultural Officer, Salem.	1 July 1960.	13 Dec. 1960.	„ R. Ramanathan.
	14 Dec. 1960.	30 June 1961.	„ S. V. Hariharan.
District Agricultural Officer, Krishnagiri.	1 July 1960.	11 July 1960.	„ G. Venkatakrishnan.
	12 July 1960.	30 June 1961.	„ T. K. Sankarasubramanyan.
District Agricultural Officer, Ootacamund.	Throughout.		„ K. Hanumantha Rao.
Superintendent, Agricultural Research Station, Nanjanad.	1 July 1960.	10 Sep. 1961.	„ K. Radhakrishna Alwa.
	11 Sep. 1960.	19 Mar. 1961.	„ K. Hanumantha Rao (in charge).
	20 Mar. 1961.	30 June 1961.	„ K. K. Ananthanarayana.

APPENDIX 28—cont.

*Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.*

Name of the post.	Period.		Name of the Officer in charge.
	From	To	
(1)	(2)	(3)	(4)
Coimbatore Division—cont.			
Superintendent, Agricultural Research Station, Bhavani-sagar.	1 July 1960.	20 Aug. 1960.	Sri K. Saptharishi.
	30 Aug. 1960.	20 Oct. 1960.	„ V. Srinivasan (in charge).
	21 Oct. 1960.	23 Dec. 1960.	Srimathi L. Dhanaraj.
	24 Dec. 1960.	2 Jan. 1961.	Sri N. Srinivasan (in charge).
	3 Jan. 1961.	26 June 1961.	Srimathi L. Dhanaraj.
	27 June 1961.	30 June 1961.	Sri V. Srinivasan (in charge).
Curator, Ootacamund.	Throughout.		„ B.G. Narayana Menon.
Assistant Agricultural Engineer (Inspection), Coimbatore.	Throughout.		„ K. Thandayutham.
Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	1 July 1960.	20 Oct. 1960.	„ K. Gopalakrishnan.
	21 Oct. 1961.	30 June 1961.	„ J. R. D. Vaz.
Assistant Agriculture Engineer (Soil Conservation Scheme), Coimbatore.	1 July 1960.	1 Nov. 1960.	„ Leo Swamikan.
	2 Nov. 1960.	..	Agricultural Engineering Supervisor (in-charge).
	3 Nov. 1960.	30 June 1961.	Sri K. R. Thiruvengadaswamy.
Assistant Agricultural Engineer (Sub-Assistant Training), Coimbatore.	1 July 1960.	2 Nov. 1960.	Do.
	3 Nov. 1960.	30 June 1961.	„ Leo Swamikan.
Assistant Soil Conservation Officer (Agronomy) Coimbatore.	2 June 1961.	30 June 1961. (New Post).	„ S. R. Santhanam.
Assistant Director (Drilling), Salem.	Throughout.		„ K. Srinivasan.
Assistant Agricultural Engineer (Soil Conservation), Salem.	1 July 1960.	30 June 1961.	„ S. Ramiah.
Assistant Agricultural Engineer (Soil Conservation), Coonoor.	Throughout.		„ K. P. Sanjeeva Shetty

APPENDIX 28—cont.

*Appointments, postings and transfers of Gazetted Officers from
1st July 1960 to 30th June 1961—cont.*

Name of the post.	Period.		Name of the Officer in charge.
	From	To	
(1)	(2)	(3)	(4)
<i>Coimbatore Division—cont.</i>			
Assistant Agricultural Engineer (Soil Conservation), Ootacamund.	Throughout.		Sri S. Raju.
Assistant Agricultural Engineer (Soil Conservation) (Kundha), Coonoor.	29 May 1961.	30 June 1961. (New Post).	„ P. R. S. Mahalingam.
Assistant Agricultural Engineer (Dry Farming), Palladam.	Throughout.		„ A. N. Ramalingam.
Investigation Officer, Coimbatore.	20 Mar. 1961.	30 June 1961. (Now Post).	„ R. Subramanyam.
District Investigation Officer, Coimbatore.	8 Mar. 1961.	30 June 1961.	„ G. Venkatramanan.
Tobacco Development Officer, Coimbatore.	30 Aug. 1960.	30 June 1961. (New Post).	„ K. Saptharishi.
Assistant Agronomist, Simple Fertiliser Trials, Coimbatore.	11 July 1960.	30 June 1961. (New Post).	„ S. Arunachalam.

Officers who were on leave during the period under report.

Name of the officer.	Period	
	From	To
Sri C. K. Ramachandran	16 Aug. 1960.	29 Aug. 1960.
„ A. Abdul Samad	17 Feb. 1961.	18 Mar. 1961.
„ V. K. Appaji	2 June 1960.	7 Aug. 1960.
„	15 Apr. 1961.	16 Aug. 1961.
„ C. Ekambaram	8 Aug. 1960.	27 Sep. 1960.
„	16 Jan. 1961.	23 Jan. 1961.
Dr. S. Kanakraj David	24 Sep. 1960.	22 Dec. 1960.
Sri K. M. Krishna Menon	24 Mar. 1961.	16 Apr. 1961.
„ Md. Basheer	17 May 1960.	12 Aug. 1960.
„	5 Dec. 1960.	12 Jan. 1961.
„ T. S. Palanivelu	13 Mar. 1961.	30 Mar. 1961.
„ K. H. Subramanya Iyer	19 July 1960.	20 July 1960.
„	4 Mar. 1961.	15 June 1961.
„ K. Fazhullah Khan	4 Aug. 1960.	27 Aug. 1960.
„ S. V. Ramachandran	1 July 1960.	..

APPENDIX 28—cont.

Officers who were on leave during the period under report—cont.

Name of the officer.	Period	
	From	To
Sri M. J. David	4 Nov. 1960.	28 Mar. 1961.
„ L. Krishnan	17 May 1961.	16 June 1961.
„ T. K. Thangavelu	1 Mar. 1961.	30 Mar. 1961.
„ N. Ramesh Adyanthiah	13 Dec. 1960.	31 Mar. 1961.
„ K. R. Sudaresan	11 July 1960.	23 July 1960.
„ S. Gonsalves	4 June 1960.	4 July 1960.
„ V. G. Venkataramana Rao	6 Nov. 1960.	7 Dec. 1960.
„ S. Varadarajan	27 Mar. 1961.	18 May 1961.
„ K. Thandavarayan	1 Dec. 1960.	2 Dec. 1960.
Srimathi Grijja Balasubramanyan	22 Apr. 1961.	31 May 1961.
Sri P. A. Murthy	1 May 1961.	11 May 1961.
„ P. A. Mohamed Ibrahim	8 Apr. 1961.	29 Apr. 1961.
„ G. Ramachandran	9 June 1961.	30 June 1961.
„ S. Muthuswamy	6 May 1960.	24 July 1960.
„	15 Oct. 1960.	20 Oct. 1960.
„	6 Apr. 1961.	27 Apr. 1961.
„ D. John Dorai Raj	23 Mar. 1961.	25 Mar. 1961.
„	12 Apr. 1961.	13 Apr. 1961.
„ T. S. Dakshinamurthy	1 Dec. 1960.	24 Dec. 1960.
„	3 June 1961.	1 Aug. 1961.
„ K. R. Raman	16 July 1960.	4 Aug. 1960.
„	12 June 1961.	23 June 1961.
„ J. Vaithyanathan	6 Jan. 1961.	5 Apr. 1961.
„ V. Sethuraman	18 Jan. 1961.	6 Feb. 1961.
„ Kitchanan	11 Apr. 1961.	30 June 1961.
„ S. Muthuswamy (Assistant Hort.).	21 Oct. 1960.	31 Oct. 1960.
„ V. Nataraja Iyer	3 July 1960.	16 July 1960.
„ M. D. Prabhu	15 Dec. 1960.	14 Apr. 1961.
„ S. Soundara Rajan	25 Sep. 1960.	8 Nov. 1960.
„ V. Venkatasubramanyan	5 Jan. 1961.	28 Jan. 1961.
„ S. Krishnamurthy	16 Oct. 1960.	27 Nov. 1960.
„ V. Ramakrishnan	7 July 1960.	16 July 1960.
Kumari A. P. Sarojini Damodaran	2 Jan. 1961.	31 Jan. 1961.
Sri C. V. Nagarajan	5 Apr. 1961.	30 Apr. 1961.
„ T. S. Muthukrishnan	6 Mar. 1961.	15 Mar. 1961.
„ S. Venugopal	28 Jan. 1961.	14 Feb. 1961.
„ K. R. Narayanaswamy	30 Oct. 1960.	16 Nov. 1960.
„ G. Venkatramanan	1 Sep. 1960.	4 Jan. 1961.

APPENDIX 29.

*Strength of staff in the Agricultural Department as on
1st July 1961 (gazetted posts).*

Serial number, service, class and category.	Designation of the post.	Posts as on 1st July 1961.		
		Perma- nent.	Tempo- rary.	Total.
(1)	(2)	(3)	(4)	(5)
1 I.A.S. ..	Director of Agriculture ..	1	..	1
2 M.A.S. ..	Dean and Additional Director of Agriculture.	..	1	1
3 „ Category 1	Joint Director of Agriculture ..	2	4	6
4 Do. ..	Associate Dean	1	..	1
5 Do. ..	Agricultural Engineer	1	..	1
6 Do. Category 2	Deputy Director of Agriculture.	3	1	4
7 Do. ..	Oilseeds Development Officer ..	..	1	1
8 Do. ..	State Marketing Officer	1	..	1
9 Do. ..	Agronomist and Associate Pro- fessor of Agronomy.	1	..	1
10 Do. ..	State Compost Development Officer.	..	1	1
11 Do. ..	Extension Specialist Agronomist (Package).	..	1	1
12 Do. ..	Research Engineer	..	1	1
13 Do. ..	General Superintendent, Indus- trial Engineering Workshop.	1	..	..
14 Do. ..	Professor of Agricultural Engineering.	..	1	1
15 Do. Category 3	Cotton Extension Officer ..	..	1	1
16 Do. ..	Sugarcane Specialist, Cuddalore.	..	1	1
17 Do. ..	Horticulturist	1	1	2
18 Do. ..	Tobacco Development Officer ..	..	1	1
19 Do. ..	Crop Specialist	4	..	4
20 Do. ..	Agricultural Chemist and As- sociate Professor of Soil Science	1	..	1
21 Do. ..	Entomologist and Assistant Pro- fessor of Entomology.	1	..	1
22 Do. ..	Mycologist and Associate Pro- fessor of Plant Pathology.	1	..	1
23 Do. ..	Systematic Botanist and Associate Professor of Botany.	1	..	1
24 Do. ..	Plant Protection Specialist ..	..	1	1
25 Do. Category 4	District Agricultural Officers (including Superintendent and Additional Superintendent, Central Farm, Assistant Marketing Officers, Field Manure Officers, Gazetted Assistant, etc.	17	33	50
26 Do. ..	Lecturer in Agriculture ..	1	1	1
27 Do. Category 5	Curator, Ooty	1	..	1

APPENDIX 29—cont.

*Strength of staff in the Agricultural Department as on
1st July 1961 (Gazetted posts)—cont.*

Serial number, service, class and category.	Designation of the post.	Posts as on 1st July 1961.		
		Perma- nent.	Tempo- rary.	Total.
(1)	(2)	(3)	(4)	(5)
28 M.A.S., Caty. 6	Assistant Entomologist	2	5	7
29 Do. ..	Assistant Mycologist including Lecturers.	1	7	8
30 Do. ..	Crop and Plant Protection Officer (Entomology)	..	2	2
31 Do. ..	Do. (Mycology)	..	2	2
32 Do. ..	Assistant Agricultural Chemist (including Lecturer).	4	14	18
33 Do. ..	Banana Research Officer, Aduthurai.	..	1	1
34 Do. ..	Cashew Development Officer ..	..	1	1
35 Do. ..	Assistant Horticulturist includ- ing Lecturer.	1	9	18
36 Do. ..	Lecturer in Economics	1	1	2
37 Do. ..	Assistant Botanist (including Lecturer).	1	1	2
38 Do. ..	Paddy Research Officer	..	1	1
39 Do. ..	Cytogeneticist	1	1	2
40 Do. ..	Plant Physiologist	1	2	3
41 Do. ..	Assistant Agronomists (Sugarcane)	..	5	5
42 Do. ..	Assistant Agronomist (Black soil and Fertilisers).	..	2	2
43 Do. ..	District Investigating Officer ..	..	2	2
44 Do. ..	Superintendent, Agricultural Research Stations.	6	2	8
45 Do. ..	Assistant Crop Specialists ..	..	23	23
46 Do. ..	Coconut Development Officer ..	..	1	1
47 Do. ..	Algologist	..	1	1
48 Do. ..	Agricultural Meteorologist ..	1	..	1
49 Do. Category 7	Assistant Agricultural Engineer (Research).	1	..	1
50 Do. Category 8	Assistant Agricultural Engineer (including Lecturers).	3	29	32
51 Madras General Service.	Personal Assistant to the Direc- tor of Agriculture.	1	..	..
52 ..	Accounts Officer	1	..	1
53 ..	Administrative Officers	..	2	2
54 ..	Junior Accounts Officer	..	3	3
55 Not classified ..	Deputy Director (Drilling) ..	..	1	1
	Professors in the Post Graduate Institute, Coimbatore.	..	5	5
	Readers in Do. ..	..	4	4
Total ..		64	178	242

APPENDIX 29—cont.

UPPER SUBORDINATE.

A. RESEARCH SECTION.

Abstract of permanent and temporary posts as on 30th June 1961.

Serial number and name of the post.	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
1 Chemistry Assistant	16	43	59
2 Entomology Assistant	11	5	16
3 Mycology Assistant	7	7	14
4 Paddy Assistant	20	14	34
5 Oilseeds Assistant	6	25	31
6 Sugarcane Assistant	2	13	15
7 Millet and Pulses Assistant	11	3	14
8 Botany Assistant	5	13	18
9 Cytogenetics	1	..	1
10 Statistical Assistant	..	6	6
11 Horticultural Assistant	9	20	29
12 Plant Physiology	1	1	2
13 Potato Assistant	3	..	3
14 Curator	3	..	3
15 Coconut	..	17	17
16 Chillies	..	1	1
17 Meteorology	1	1	2
18 Miscellaneous	..	20	20
19 Cotton	10	9	19
20 Agronomy	..	9	9
21 Analytical Assistant	..	13	13
Total ..	106	220	326

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.	109	356	465
2 Special Agricultural Demonstrator (Cotton).	..	20	20
3 Special Agricultural Demonstrator (Sugarcane).	..	23	23
4 Instructor in Agriculture and Farm Supervisors (RETC).	..	29	29
5 Soil Conservation Assistant	..	35	35
6 Horticultural Development Assistant	..	24	24
7 Coconut Development Assistant	..	7	7
8 Tobacco Development Assistant	..	4	4

APPENDIX 29—cont.

UPPER SUBORDINATES—cont.

B. AGRICULTURAL SECTION—cont.

Serial number and name of the post.	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
9 Oilseeds Development Assistant	..	14	14
10 Assistant Lecturer in Agriculture	8	..	8
11 Farm Managers	10	60	70
12 Marketing Assistants	4	9	13
13 Jail Instructor in Agriculture	1	..	1
14 Journal Assistant	1	..	1
15 Cashewnut Development Assistant	..	3	3
16 Technical Assistants	..	5	5
17 Plant Protection Assistants	5	48	53
18 Agronomist	..	5	5
19 Dairy Manager	..	1	1
Total	138	643	781

Strength of Engineering Staff as on 30th June 1961.

Serial number and name of the post.	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
1 Agricultural Engineering Supervisor	12	78	90
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 mechanics	1	21	22
7 Junior mechanics	1	7	8
8 Mechanic, I Grade	6	5	11
9 Do. II Grade	7	6	13
10 Do. III Grade	14	6	20
11 Supervisors (Pumping and Boring)	14	4	18
12 Draughtsman, III Grade	1	9	10
13 Do. I Grade	1	..	1
14 Borewell foreman	53	67	120
15 Drillers	19	6	25
16 Assistant drillers	25	11	36
17 Blasting supervisors	..	7	7
18 Air compressor mechanic	2	..	2
19 Lorry drivers	1	34	35
20 General foreman (Pumping and Boring).	1	..	1

APPENDIX 29—cont.

Strength of Engineering staff as on 30th June 1961—cont.

Serial number and name of the post.	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
21 General Foreman Agricultural (Engineering Branch).	..	1	1
22 Section maistries	3	..	3
23 Time-keepers	1	..	1
24 Tracer	1	10	11
25 Inspector of Power Drills	2	..	2
26 Senior tractor driver	..	77	77
27 Junior tractor drivers	..	201	201
28 Oil engine driver	..	275	275
29 Tractor cleaner	..	138	138
30 Lorry and bus cleaner	..	20	20
31 Jeep drivers	..	52	52
32 Propaganda van driver	..	1	1
33 Truck driver	..	1	1
34 Drill supervisor	..	5	5
35 Bus driver	..	2	2
36 Stores Superintendent	..	3	3
37 Store-keeper, I Grade	..	15	15
38 Pump and motor attendant	..	11	11
39 Gasman	..	6	6
40 Turner	..	2	2
41 Electrician	..	1	1
42 Head fitter	..	1	1
43 Fitters	..	17	17
44 Coppersmith	..	2	2
45 Hammerman	..	3	3
46 Blacksmith	..	6	6
47 Welders	..	4	4
48 Moulder	..	1	1
49 Machanist	..	3	3
50 Carpenter	..	1	1
51 Wireman	..	2	2
52 Packers	..	3	3
53 Helper to wireman	..	2	2
54 Compressor driver	..	10	10
55 Rock drill operator	..	14	14
56 Miller	..	1	1
57 Drill mechanics	..	9	9
58 Well testing mechanics	..	4	4
59 Borawill foreman-cum-store-keeper	..	11	11
60 Technical Assistant	..	1	1
61 Diesel Mechanic-cum-fitter	..	1	1
62 Fitter helper	..	1	1
63 Soil Conservation Sub-Assistant	..	91	91
64 Engineering Maistry	..	3	3
65 Carpenter-cum-pattern maker	..	1	1
66 Station Wagon Driver	..	2	2

APPENDIX 29—cont.

Madras Agricultural Subordinate Service.

Name of the post.	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
Fieldmen	101	563	664
Compost Development Inspector	..	207	207
Sliver-maker	..	1	1
Artist	9	3	12
Librarian	1	2	3
Assistant Librarian	1	..	1
Computer	..	1	1
Photographer	1	..	1

Madras Ministerial Service.

Manager	1	..	..
Superintendents	13	77	90
Stores Superintendent	..	3	3
Senior Steward	..	1	1
Junior Steward	..	1	1
Upper Division Clerks	47	265	312
Commercial Accountant	1	..	1
Lower Division Clerks	166	742	908
Typists	44	162	206
Steno-typists	4	28	32
Store-keeper, II Grade	5	20	25

Madras General Subordinate Service.

Demonstration Maistries, Grade I.	34	..	34
Do. Grade II.	181	947	1,128
Laboratory Attenders	19	60	79
Attenders (Office) (including Library Attendants).	7	26	33
Inspectory Attendant	1	..	1

Madras Last Grade Service.

Peons	165	377	542
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Miscellaneous Post.

Kamdar	..	6	6
Sanitary Inspector	1	..	1
Museum Curator	1	..	1
Stock man	1	..	1

APPENDIX 30

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1961.

Sr. 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)
1	21	Cotton and multiplication Scheme in Coimbatore District.	Special Agricultural Demonstrator (Cotton).	3	G.O. Ms. No. 919, Food and Agriculture, dated 2nd March 1959.	..	30th June 1963.
2	104	Scheme for the control of pests and diseases and plant protection included in the Second Five-Year Plan.	Plant Protection Assistants. Technical Assistants.	43	G.O. Ms. No. 605, Food and Agriculture, dated 25th February 1961.	..	28th February 1962.
3	115	Scheme for the Development of Sugarcane in Madras State.	Special Agricultural Demonstrator (Sugar) Technical Assistant.	21	G.O. Ms. No. 1771, Food and Agriculture, dated 16th May 1961.	..	28th February 1962.
4	193	Agricultural Research Station Bhavanisagar.	Farm Managers.	4	G.O. Rt. No. 407, Food and Agriculture, dated 11th March 1961.	..	28th February 1962.
5	254	Scheme for increasing the production of oilseeds in Madras State.	Oilseeds Development Assistant.	4	Government Memorandum No. 65447 B.IV/61-2, Food and Agriculture, dated 12th February 1961.	..	31st August 1961.
6	265	Reorganisation and Revision of jurisdiction consequent on sanction of posts under National Extension Service/Community Development Schemes.	Agricultural Demonstrators.	81	G.O. Rt. No. 539, Food and Agriculture, dated 29th March 1961.	..	28th February 1962.

7	282	Soil Conservation Scheme.	Soil Conservation Assistant.	35	G.O. Ms. No. 1450, Food and Agriculture, dated 19th April 1961.	..	28th February 1962.
					G.O. Ms. No. 1360, Food and Agriculture, dated 14th April 1961.	..	..
					G.O. Ms. No. 387, Food and Agriculture, dated 9th February 1960.	..	..
8	283	The Tanjore Co-operative Cotton Marketing Society Ltd.	Special Agricultural Demonstrator (Cotton)	1	G.O. Ms. No. 3602, Industries, Labour and Co-operation, dated 11th May 1961.	..	28th February 1962.
9	298	Multiplication and Distribution of Improved seeds opening of State Seed Farm.	Farm Managers	55	G.O. Ms. No. 1419, Food and Agriculture, dated 18th April 1961.	..	28th February 1962.
10	299	Strengthening of Agricultural College.	Dairy Manager Agronomy Assistant	1	G.O. Ms. No. 1938, Food and Agriculture, dated 25th May 1961.	..	31st May 1962.
11	302	Cotton Extension Scheme.	Special Agricultural Demonstrator (Cotton).	1	G.O. Ms. No. 3222, Food and Agriculture, dated 19th September 1960.	..	30th September 1961.
12	319	Intensive Khadi Scheme ..	Special Agricultural Demonstrators, (Cotton).	3	B.P. No. 89, dated 28th March 1961. Madras Khadi and Village Industries Board.	..	28th February 1962.
13	333	Market News Scheme (Carandam).	Marketing Assistant.	1	G.O. Ms. No. 483, Food and Agriculture, dated 17th February 1961.	..	28th February 1962.
14	339	Scheme for the Development of Fruit production	Horticulture Development Assistant.	13	G.O. Ms. No. 1137, Food and Agriculture, dated 28th March 1961.	..	28th February 1962.
15	340	Scheme for Establishment of Parasite Breeding Station	Plant Protection Assistant.	2	Government Memorandum No. 150776/B.IV/61-11, Food and Agriculture, dated 23rd March 1961.	..	30th September 1961.

APPENDIX 30—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1961—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)
16	342	Cocunut Development Scheme.	Agricultural Demonstrator (Cocunut Development Assistant).	6	Government Memorandum No. 151165 B. IV/60-7, dated 31st March 1961.	..	31st May 1961.
17	343	Scheme for increasing production of oilseeds.	Oilseed Development Assistant.	10	Government Memorandum No. 65299/61-2, Food and Agriculture, dated 21st June 1961.	..	31st August 1961.
18	351	National Scheme.	Extensive Instructor in Agriculture.	22	G.O. Ms. No. 892, Rural Development and Local Administration Department, dated 23rd March 1961.	..	..
			Farm Supervisors ..	6	G.O. Ms. No. 590, Rural Development and Local Administration Department, dated 2nd March 1961.	..	..
			Farm Manager ..	1	G.O. Ms. No. 593, Rural Development and Local Administration Department, dated 2nd March 1961.	..	28th February 1962.
					G.O. Ms. No. 674, Rural Development and Local Administration Department, dated 8th March 1961.	..	..
					G.O. Ms. No. 759, Rural Development and Local Administration Department, dated 14th March 1961.	..	..
					G.O. Ms. No. 893, Rural Development and Local Administration Department, dated 23rd March 1961.	..	..
					G.O. Ms. No. 591, Rural Development and Local Administration Department, dated 2nd March 1961.	..	..
19	356	Development of Fruit products, Model Orchard-cum-Nurseries.	Horticultural Development Assistant.	6	G.O. Ms. No. 2722, Food and Agriculture department, dated 8th August 1961.	..	31st March 1962.
20	357	Schemes for Development of cashew nut cultivation in Madras State.	Cashew Development Assistant.	3	G.O. Ms. No. 1533, Food and Agriculture, dated 25th April 1961.	..	28th February 1962.
21	360	Extension Officers for Agriculture.	Extension Officers ..	254	G.O. Ms. No. 747, Rural Development and Local Administration department, dated 13th March 1961.	..	Do.
22	361	Scheme for conducting trials of Biological Measures in Soil Conservation works.	Agronomy Assistants.	2	G.O. Ms. No. 841, Food and Agriculture, dated 13th March 1961.	..	Do.
23	364	Scheme for the Establishment of three vegetable seed production centres at Kodakanal, Thirumapuram of Periakulam.	Horticulture Development Assistant.	3	G.O. Ms. No. 2647, Food and Agriculture, dated 1st September 1960.	..	4th July 1961.
24	365	Scheme for publicity of Marketing activities for development of Agmark Grading and Setting up of State Laboratories.	Marketing Assistants.	7	G.O. Ms. No. 887, Food and Agriculture, dated 14th March 1961.	..	28th February 1962.

APPENDIX 30—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1961—cont.

Serial number	Scheme number	Name of the scheme.	Names of Post.	Number sanctioned.	G.O. number and date.	From	To
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
25	367	Vocational training in Agriculture to Elementary school teachers.	Special Agricultural Demonstrators.	9	G.O. Ms. No. 1844, Food and Agriculture, dated 30th April 1959.	..	28th February 1962.
26	369	Scheme for carrying out effective plant protection Measures on Oil seeds crops in Madras State.	Plant Protection Assistants.	3	Government Memo randum No. 146469 B-IV/60-10, Food and Agriculture, dated 17th July 1961.	..	30th September 1961.
27	371	Scheme for Establishment of four demonstrators coconut Kazhuvelli Swamp area in Tindivanam taluk.	Coconut Development Assistant.	1	Government Memo randum No. 150747 B-IV/60-6, Food and Agriculture, dated 18th March 1961.	..	31st May 1961.
28	372	Establishment of Extension Demonstration.	Extension Demonstrators.	5	G.O. Ms. No. 2136, Food and Agriculture, dated 28th May 1959.	..	2nd August 1961.
29	376	Co-operative Societies, Farming Societies, Joint Farming Societies, Belkapuram, Ootacamund taluk.	Agricultural Demonstrator.	1	G.O. Ms. No. 1174, Co-operative, dated 5th March 1960.	..	28th February 1961.
30	385	Government Basic Training College, Employment of an Instructor of Agriculture, Oorathanad.	Instructor in Agriculture.	1	G.O. Ms. No. 571, Education, dated 24th March 1961.	..	30th June 1961.

31	387	Harijan Welfare Scheme.	Horticulture Development Assistant.	2	G.O. Rt. No. 1662, Home, dated 14th April 1961.	28th February 1962.
32	389	Marketing adoption of Metric System of Weights and Measures in Agriculture Department.	Special Officer ..	1	G.O. Ms. No. 1042, Food and Agriculture, dated 23rd March 1961.	Do.
33	391	Tobacco Comprehensive Scheme.	Tobacco Development Assistant.	4	G.O. Ms. No. 2784, Food and Agriculture, dated 31st July 1961.	Do.
34	402	Sugar cultivation by Co-operative Mills, Madurantagan.	Special Agricultural Demonstrator (Sugar cane).	2	G.O. Ms. No. 3158, Food and Agriculture, dated 16th September 1960.	30th September 1962.
35	403	Scheme for multiplication of Distribution KB. MCU. 2 Cotton seeds of Madras State.	Special Agricultural Demonstrators (Cotton).	12	G.O. Ms. No. 3311, Food and Agriculture, dated 27th September 1960.	30th September 1965.
36	44	Evolution of long staple Cotton cotton.	Cotton Assistants ..	2	G.O. Ms. No. 2433, Food and Agriculture, dated 13th August 1957.	22nd November 1961.
37	69	Agricultural Research Station, Ambasamudram.	Paddy Assistant ..	1	G.O. Ms. No. 1457, Food and Agriculture, dated 21st November 1961.	31st August 1961.
38	103	Coconut Nursery Scheme..	Coconut Nursery Assistants.	11	Government Memo. No. 150765 B-IV/60-5, Food and Agriculture, dated 4th March 1961.	Do.
39	114	Banana Research Station, Adukkurai.	Fruit Assistants.	2	G.O. Ms. No. 2100, Food and Agriculture, dated 7th June 1961.	31st March 1962.

Research Section.

APPENDIX 30—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1961—cont.

Serial number	Name of the scheme.	Name of the post.	Number sanctioned	G.O. number and date.	From	Up to
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Research section—cont.</i>						
40	135 Improvement of Karunaganni and Tirunelveli Cotton.	Cotton Assistants	..	5 G.O. Ms. No. 4143, Food and Agriculture, dated 9th December 1959.	..	17th June 1964.
41	136 Fruit Products	M.A.C.N. Fruit Assistants	..	3 G.O. Ms. No. 2099, Food and Agriculture, dated 7th June 1961.	..	31st March 1966.
42	139 Statistical Assistant for Meteorology Section.	Statistical Assistants.	1	G.O. Rt. No. 259, Food and Agriculture, dated 14th February 1961.	..	28th February 1962.
43	193 Agricultural Research Station, Bhavanisagar.	Research Assistant	..	1 G.O. Ms. No. 407, Food and Agriculture, dated 11th March 1961.	..	28th February 1962.
44	195 Zonal Nucleus Oilseeds Farm of improved strain.	Assistant in Oilseeds	5	Government Memo. No. 6546 R. IV/61-2, dated 21st June 1961.	..	31st August 1961.
45	199 Cotton Certification Scheme.	Certification Inspectors	6	Government Memo. No. 20735-C. III-3/61/4, dated 26th June 1961.	..	31st October 1961.
46	205 Agricultural Research Station, Paramakudi.	Research Paddy Assistant	..	1 Government Memo. No. 2229 VII/62.2, Food and Agriculture, dated 19th January 1961.	..	28th February 1962.

47	237 Scheme for Breeding of Pericarpia Resistant Strains of Paddy of different duration.	Paddy Assistants	..	3 G.O. Ms. No. 732, Food and Agriculture, dated 6th March 1961.	..	31st March 1962.
48	242 Scheme for Improvement of Vegetables.	Horticultural Assistant.	1	G.O. Ms. No. 513, Food and Agriculture, dated 17th February 1960.	..	28th February 1962.
49	260 Research in Physiology of Groundnut Nutrition in Madras State.	Oilseeds Assistants	..	2 G.O. Ms. No. 85, Food and Agriculture, dated 10th January 1961.	..	17th February 1962.
50	261 Intensive of Breeding of Groundnut.	Do.	2	Government Memo. No. 7541 B. IV/60-31, Food and Agriculture, dated 5th May 1961.	..	30th June 1961.
51	262 Research on leguminous and fodders.	Research Assistants in Botany.	1	G.O. Ms. No. 640, Food and Agriculture, dated 2nd March 1961.	..	30th April 1962.
52	266 Sugarcane Research Scheme, Cuddalore.	Sugarcane Research Assistants.	9	Government Memo. No. 29706 B. III/61-62, dated 3rd May 1961.	..	31st June 1962.
53	267 Clove, Nutmeg, Cocoa Scheme.	Assistant in Horticulture.	2	G.O. Ms. No. 1558, Food and Agriculture, dated 2nd May 1960.	..	31st March 1966.
54	268 Evolution of drought resistant strains of paddy.	Assistant in Paddy	..	2 G.O. Ms. No. 1481, Food and Agriculture, dated 21st April 1960.	..	31st March 1966.
55	270 Model Agro Experiments at Bhavanisagar.	Assistant in Agronomy.	2	G.O. Ms. No. 710, Food and Agriculture, dated 28th February 1960.	..	28th February 1961.
56	272 Paddy Stem Borer Scheme, Aduthurai.	Assistant in Botany..	1	G.O. Ms. No. 300, Food and Agriculture, dated 31st January 1960.	..	31st March 1962.
57	276 Scheme for Improvement of Chillies.	Assistant in Chillies	..	1 G.O. Ms. No. 108, Food and Agriculture, dated 11th January 1961.	..	28th February 1962.

APPENDIX 30—cont.

List of temporary posts of Upper Subordinates under various schemes as on 30th June 1961—cont.

Serial number.	Scheme number.	Name of the scheme.	Name of the Post.	Number sanctioned.	G.O. number and date.	From	Up to.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
58	279	Multi Crop Fruit Research Station.	Assistant in Horticulture.	3	G.O. Ms. No. 886, Food and Agriculture, dated 28th February 1961.	..	30th September 1961.
59	280	Agricultural Statistical Section, Coimbatore.	Assistant in Agricultural Statistics.	1	G.O. Ms. No. 107, Food and Agriculture, dated 11th January 1961.	..	28th February 1962.
60	293	Establishment of Groundnut Experimental Station, Pollachi.	Assistant in Oilseeds.	2	Government Memo. No. 5881 B. IV/81-26, dated 21st July 1961.	..	30th September 1961.
61	296	Studies on reversion of phosphate in laterite soil in the Nilgiris.	Assistant in Chemistry.	1	G.O. Ms. No. 1624, Food and Agriculture, dated 4th May 1960.	..	31st March 1962.
62	297	Reclamation of Saline and Alkaline lands.	Do.	2	G.O. Ms. No. 722, Food and Agriculture, dated 6th March 1961.	..	31st March 1963.
63	299	Strengthening of Agricultural College.	Assistant in Botany.. Chemistry Assistant Horticulture Assistant Mycology .. Miscellaneous ..	4 4 1 1 2	G.O. Ms. No. 2703, Food and Agriculture, dated 4th August 1960.	..	1st June 1962.
64	304	Investigation of Betelvine disease.	Assistant in Mycology.	1	G.O. Ms. No. 1556, Food and Agriculture, dated 29th April 1960.	..	31st March 1963.
65	305	Urban Compost Scheme ..	Analytical Assistant ..	3	G.O. Ms. No. 782, Food and Agriculture, dated 4th March 1960.	..	28th February 1961.
66	309	Training Centre of Research Works in Oilseeds at Jindivanam.	Assistant in Oilseeds..	1	G.O. Ms. No. 2646, Food and Agriculture, dated 8th November 1956.	..	Not yet stated.
67	310	Regional Coconut Research Station.	Assistant in Coconut..	2	G.O. Ms. No. 122, Food and Agriculture, dated 19th January 1960.	..	13th March 1961.
68	311	Additional Staff of Meteorologist.	Meteorologist Assistant.	1	G.O. Ms. No. 1546, Food and Agriculture, dated 26th April 1961.	..	28th February 1962.
69	312	Sugarcane Zonal Farm at Vadapathimangalam.	Cane Assistant ..	4	G.O. Ms. No. 1771, Food and Agriculture, dated 16th May 1961.	..	28th February 1962.
70	314	Improvement of Gur Manufacture and Storage.	Chemistry Assistant.	1	G.O. Ms. No. 581, Food and Agriculture, dated 24th February 1961.	..	31st March 1962.
71	320	Kanyakumari Staff ..	Horticulture Assistant.	1	G.O. Ms. No. 1410, Food and Agriculture, dated 26th March 1959.	..	..
72	321	Sugarcane Research Station, Kulitalai.	Agronomy Assistant. Mycology Assistant. Chemistry Assistant.	3 1 1	Government Memorandum No. 23122 B. IV/61-5, Food and Agriculture, dated 22nd July 1961.	..	30th September 1961.
73	327	Development of Local Manurial Resources.	Chemistry Assistant.	2	G.O. Ms. No. 696, Food and Agriculture, dated 31st March 1961.	..	28th February 1962.
74	328	Fertilizer Control Order ..	Analytical Assistant.	3	G.O. Ms. No. 1224, Food and Agriculture, dated 3rd April 1961.	..	Do.
75	329	Ghee Testing and Grading Scheme	Chemistry Assistant.	3	G.O. Ms. No. 833, Food and Agriculture, dated 26th February 1959.	..	29th February 1960.

APPENDIX 30—cont.

List of temporary of Upper Subordinates under various schemes as on 30th June 1961—cont.

Serial Number.	Name of the scheme.	Name of post.	Number sanctioned.	G.O. number and date.	From	To
(1)	(2)	(3)	(4)	(5)	(6)	(7)
76	331 Blast Resistant in Paddy.	Research Assistant in Chemistry.	2	G.O. Ms. No. 492, Food and Agriculture, dated 31st January 1961.	...	31st March 1962.
77	334 Green Manure Crop Scheme.	Chemistry Assistant.	2	G.O. Ms. No. 238, Food and Agriculture, dated 25th January 1961.	..	31st March 1962.
78	335 Storage of Groundnut Scheme.	Storage Assistant .. Entomology Assistant	1	G.O. Ms. No. 1131, Food and Agriculture, dated 28th March 1961.	..	18th April 1962.
79	338 Cytogenetical Studies of Grape.	Mycology Assistant .. Botany Assistant	1	G.O. Ms. No. 2733, Food and Agriculture, dated 5th September 1957.	..	3rd January 1963.
80	341 Soil Survey of Sugarcane Crop.	Chemistry Assistant.	4	G.O. Ms. No. 582, Food and Agriculture, dated 24th February 1961.	..	31st March 1962.
81	347 Hybrid Cumbu Scheme ..	Millet and Pulses Assistant.	1	G.O. Ms. No. 793, Food and Agriculture, dated 11th March 1961.	..	21st November 1961.
82	348 Research on Fungicides.	Research Assistant in Mycology.	1	G.O. Ms. No. 2798, Food and Agriculture, dated 1st August 1961.	..	31st March 1962.

AGRICULTURAL DEPARTMENT

83	349 Post Graduate Course.	Botany Assistant 1 Chemistry Assistant 1 Entomology Assistant 1	1	G.O. Ms. No. 425, Food and Agriculture, dated 13th February 1961.	..	28th February 1962.
84	352 Simple Manual Trials in cultivator's fields.	Mycology Assistant 1 Horticulture Assistant 1 Agronomy Assistant 1	4	G.O. Ms. No. 1845, Food and Agriculture, dated 19th May 1961.	..	31st March 1962.
85	353 Evolution of paddy strain for increased areas.	Paddy Assistant ..	1	G.O. Ms. No. 2863, Food and Agriculture, dated 28th August 1958.	..	16th September 1961.
86	355 Hybrid Castor Production.	Assistant in Oilseeds ..	2	G.O. Ms. No. 2203, Food and Agriculture, dated 24th June 1958.	..	Five years.
87	358 Soil Survey work in Amaravathi Project area.	Soil Survey Assistant.	3	Government Memorandum No. 176439 B. II/60-2, Food and Agriculture, dated 27th February 1961.	..	28th February 1962.
88	361 Trials of biological measure in soil conservation.	Agronomy Assistant .. Botany Assistant ..	2	G.O. Ms. No. 841, Food and Agriculture, dated nil.	..	28th February 1962.
89	362 Breeding of gingelly Seeds.	Oilseeds Assistant ..	2	G.O. Ms. No. 2336, Food and Agriculture, dated 16th June 1961.	..	8th July 1962.
90	365 Grading Agmark Scheme.	Chemistry Assistant ..	6	G.O. Ms. No. 887, Food and Agriculture, dated 14th March 1961.	..	28th February 1962.
91	366 Gur Grading Scheme ..	Chemistry Assistant ..	1	G.O. Ms. No. 2317, Food and Agriculture, dated 22nd June 1961.	..	31st March 1962.
92	368 Mango production ..	Horticultural Assistant.	4	Government Memorandum No. 113376 B-IV/60-12, Food and Agriculture, dated 4th August 1961.	..	7th October 1961.

APPENDIX 30—cont.

List of temporary of Upper Subordinates under various schemes as on 30th June 1961—cont.

Serial number.	Name of the scheme.	Name of post.	Number sanctioned.	G.O. number and date.	From	To
(1)	(2)	(3)	(4)	(5)	(6)	(7)
93	370 Soil Survey Scheme ..	Assistant in Soil survey.	3	G.O. Ms. No. 1799, Food and Agriculture, dated 27th April 1959.	..	(8) 31st March 1961.
94	373 Breeding short-term Rice seed dormancy Scheme.	Paddy Assistant ..	2	G.O. Ms. No. 1994, Food and Agriculture, dated 10th May 1959.	..	31st March 1961.
95	374 Black soil region of Agroeconomic research in South Ind a.	Agronomic Assistant Statistical Assistant.	1 } 1 }	G.O. Ms. No. 2682, Food and Agriculture, dated 24th July 1961.	..	31st March 1962.
96	375 Lab.-lab Scheme ..	Millet Assistant ..	1	G.O. Ms. No. 1945, Food and Agriculture, dated 11th May 1959.	..	31st March 1964.
97	378 X-Ray Unit Scheme ..	Assistant ..	1	G.O. Ms. No. 2071, Food and Agriculture, dated 21st May 1959.	..	Not filled up.
98	379 Additional staff to Systematic Botanist and Professor of Botany, Coimbatore.	Botany Assistant ..	1	Government Memo No.4418-B. III/61-2, Food and Agriculture, dated 24th January 1961.	..	28th February 1962.
99	380 Evolution of superior saline and alkaline resistant strains of paddy.	Paddy Assistant ..	3	G.O. Ms. No. 2299, Food and Agriculture, dated 21st June 1961.	..	31st March 1962.

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100	381 Study of Nitrogen fixing blue green Algae in Rice Soils.	Assistant in Chemistry.	1	G.O. Ms. No. 1200, Food and Agriculture, dated 12th April 1961.	..	Do.
101	382 Development of Coconut cultivation in Ramanaathapuram.	Coconut Nursery Assistant.	4	G.O. Ms. No. 2997, Food and Agriculture, dated 13th August 1959.	..	25th January 1961.
102	384 Scheme for the co-ordinated manual trials on Groundnut in Madras State.	Oil seeds Assistant ..	6	G.O. Ms. No. 2823, Food and Agriculture, dated 29th July 1959.	..	28th February 1962.
103	386 Scheme for Establishment of soil testing laboratory at Aduthurai.	Analytical Assistant ..	3	G.O. Ms. No. 1717, Food and Agriculture, dated 10th May 1961.	..	Do.
104	388 Scheme for Improvement of pericarpia vegetable in Madras State.	Horticultural Assistant.	1	G.O. Ms. No. 453, Food and Agriculture, dated 8th March 1961.	..	31st March 1962.
105	390 Scheme for the improvement of Safflower of Nigor in Madras State.	Oilseeds Assistant ..	2	G.O. Ms. No. 2584, Food and Agriculture, dated 17th July 1961.	..	28th July 1962.
106	392 Scheme for Maximisation of phosphates potential of soils in Madras State.	Chemistry Assistant ..	6	G.O. Ms. No. 2434, Food and Agriculture, dated 14th July 1960.	..	Not filled up.
107	393 Scheme for investigation of Banana disease in Madras.	Assistant in Mycology.	1	G.O. Ms. No. 2604, Food and Agriculture, dated 28th July 1960.	..	11th August 1961.
108	394 Scheme for Micro Nutrient Studies on crop plant.	Assistant in Plant Physiology.	1	G.O. Ms. No. 1178, Food and Agriculture, dated 30th March 1961.	..	31st March 1962.
109	395 Scheme for evolution of drought resistant strains of Sorghum.	Assistant in Millet ..	1	G.O. Ms. No. 1179, Food and Agriculture, dated 30th March 1961.	..	Do.
110	396 Scheme for Establishment of a Research Station improvement of Apple.	Horticultural Assistant.	1	G.O. Ms. No. 1280, Food and Agriculture, dated 6th April 1961.	..	28th February 1962.

APPENDIX 30—cont.

List of temporary of Upper Subordinates under various schemes as on 30th June 1961—cont.

Serial number	Name of the scheme.	Name of post.	Number sanctioned.	G.O. number and date.	From	To
(1)	(2)	(3)	(4)	(5)	(6)	(7)
111	308 Soil Testing Laboratory at Coimbatore.	Analytical Assistant ..	3	G.O. Ms. No. 3008, Food and Agriculture, dated 17th September 1961.	..	31st August 1963.
112	400 Sugarcane Borer pest Scheme.	Assistant in Entomology.	1	Government Memo. No. 16571 B. III/61-5, Food and Agriculture, dated 29th March 1961.	..	30th June 1961.
113	401 Co-ordinated Scheme for Research in study of field rats.	Ento Assistant ..	1	G.O. Ms. No. 2971, Food and Agriculture, dated 30th August 1960.	..	31st July 1964.
114	405 Scheme for the Establishment of an Agricultural Economic and Rural Sociology Section.	Statistical Assistant ..	1	G.O. Ms. No. 29, Food and Agriculture, dated 3rd January 1961.	..	28th February 1962.
115	406 Scheme for enquiry into the Economics of irrigation in Coimbatore District.	Statistical Assistant Taluk investigators..	1 } 2 }	G.O. Ms. No. 260, Food and Agriculture, dated 28th January 1961.	..	31st March 1962.
116	410 Scheme for operational Research for studying the extent to which the Agricultural practices are being adopted.	Statistician .. District investigators.	1 } 2 }	G.O. Ms. No. 3539, Food and Agriculture, dated 24th October 1960.	..	19th March 1962.
117	412 Starting integration of pre-professional Course in Agriculture.	Assistant Lecturers in Chemistry and Botany.	3	G.O. Ms. No. 2046, Food and Agriculture, dated 3rd June 1961.	..	One year from the date of Appointment.
118	413 Scheme for investigation of pests in Pulses in Madras States.	Assistant in Entomology.	1	G.O. Ms. No. 2644, Food and Agriculture, dated July 1961.	..	30th June 1962.
119	414 Scheme for investigation into certain problems of Soils and Plant Analysis.	Research Assistant Instrument technician.	2 } 1 }	G.O. Ms. No. 608, Food and Agriculture, dated 20th July 1961.	..	31st March 1962.
120	415 Scheme for the Development and improvement of sea Island cotton.	Cotton Assistant ..	2	G.O. Ms. No. 617, Food and Agriculture, dated February 1961.	..	9th August 1962.

APPENDIX 31.

Statement showing the cases of defalcations, etc., for the period ending 30th June 1961.

Serial number.	Number of cases of defalcations, pending at the beginning of the year under report.	Places of occurrence.	When the irregularities were noticed.	Amounts 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 cases detected during the year.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	1947-48-1	Papanasam (Thanjavur district).	As early in 1947-48.	Rs. 3,600 36	1953 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 and recovery to the extent of Rs. 2,838 (including a sum of Rs. 538 recovered from his surety) has been effected from him and the question of filing execution petitions in respect of the other defendants is under correspondence with the Government Pleader, Madras-1 and the District Agricultural Officer, Thanjavur.	..	..
2	1949-1	Saidapet Depot (Chingleput district).	1949 ..	2,064 06	1947 ..	..	The amount of Rs. 2,084-06 with costs, is being recovered from the pay of Sri Moakes the then Agricultural Demonstrator, Saidapet, at Rs. 35 p. m. and recoveries are still in progress.	..	..

Apart from this, execution petition filed against the sureties of the ex-store-keeper for the sum of Rs. 200 is still under correspondence between the District Agricultural Officer, Guindy and the Government Pleader Chingleput.

Proposals were sent to Government to write off the irrecoverable loss sustained by Government as the Agricultural Demonstrator concerned is no more and their order are awaited.

The Civil suit in the case was decreed for Rs. 1,956-54 with subsequent interest and proportionate costs against the amount of Rs. 1,145-52. Government have written off the sum of Rs. 358-97 up, i. e., the amount disallowed by the Court. Separate action has been taken for the recovery of the decreed amount, and the question of filing the Execution petition is under correspondence with the District Agricultural Officer, Cuddalore.

Deficits were noticed in the Papanasam and Kumbakonam depots, when Sri V. Ramean was in charge of the depots. Responsibility was fixed on Sri V. Ramean and as well as on his successor Sri R. Vaidyanathan.

APPENDIX 3!—cont.

Statements showing the cases of defalcations, etc., for the period ending 30th June 1961—cont.

Serial number	Number of cases of defalcations, etc., pending at the beginning of the year under report.	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)
6	1953—1 ..	Kanchepuram (Chingleput District).	1953 ..	19,539 44 Rs. nP.	1953 ..	..	Responsibility was fixed on Sri K. Ambikacharan to make good the amount of Rs. 4,160-84 np. towards value of stocks for which he was found responsible and the sum Rs. 2,191 was recovered, but	The question of filing a suit against Sri V. Ramesan (as he is no longer in service) was considered and dropped by the Government. The amount apportioned to Sri V. Ramesan is proposed to be written off and the matter is pending with the District Agricultural Officer, Thanjavur. The amount apportioned to Sri R. Vaidyanathan is proposed to be recovered from him and the matter is being taken up by the District Agricultural Officer, Thanjavur.	

on his appeal orders were issued modifying this to a token recovery of Rs. 1,000 only and hence the amount of Rs. 1,191 is being refunded to him. The question of filing a civil suit for the amount due from the other clerks concerned is under correspondence with Government.

A sum of Rs. 1,960 for which Sri A. Varadachari, ex-depot clerk was held responsible has since been recovered. Action has been taken for the recovery of the loss of amount from the other two persons responsible and the matter is dealt with by the District Agricultural Officers, Chingleput and Guindy. As against the total loss, the amount of Rs. 5,318-24 nP. only has to be recovered from four persons. The amount apportioned to the security clerk has been adjusted from the security deposit. The amount apportioned to Sri K. C. Thomas is being recovered at Rs. 50 p. m. and recovery is in progress. The question of recovery of the amounts apportioned to two other persons, i. e. Sri S. Kasiviswanathan and Sri A. K. Annaswamy Iyer is under examination of Government.

APPENDIX 31—cont.

Statements showing the cases of defalcations, etc., for the period ending 30th June 1961—cont.

Serial number.	Number of cases of defalcation pending at the beginning of the year under report.	Place of occurrence.	When the irregularities were noticed.	Amount involved.	For what period 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)
9	1954—3 ..	1 Guindy (Chingleput district).	1954 ..	RS. NP. 5,619 44	1954 ..	..	The Agricultural Engineering Supervisor concerned is Sri K. R. Srinivasan. He has been discharged from service by termination of his probation. The Assistant Agricultural Engineer M.B. Shet, Saidapet, has been instructed to take action for the recovery of the amount due from the Agricultural Engineering Supervisor, Senior Mechanic, etc.	..	..
10	Do.	2 Central Agricultural Engineering Stores, Saidapet (Chingleput district).	1954 ..	88,900 66	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, Sri S. E. Anantharaman, Sri R. S.	..	..

11		3 Truchirapalli (Truchirapalli district).	1954 ..	Loss of cash Rs. 1,425.58, Rs. 77,296.56, value of Engineering Stores found deficit.	1954 ..	..	Sri N. Sitarman concerned clerk has absconded and the report of Police for the complaint lodged is still awaited. It has been entered in the Register of long pending cases. Regular charges have been framed against the District Agricultural Officer, Personal Assistant to District Agricultural Officer, District Agricultural Engineering Supervisor and Upper Division Clerk concerned for loss of cash	..	..
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Subramaniam, Sri A. K. Subramaniam in regard to punishment. Orders of Government are awaited. Full recoveries have been effected from Sri K. Gopalakrishnan, S. A. Thirumalai Iyengar, Sri K. Viswanathan Nair and Radhakrishnan. Recovery is being effected from the pension of Sri T. Krishna Shetty and Sri K. Subramaniam (Anticipatory and final pension) respectively. Report regarding recovery from Sri C. R. Shanmugam, Sri P. Rajavaden, Sri B. S. R. Anjaneyulu and Sri B. M. Lakshminipathi are awaited from Government. The question of write off in respect of Sri V. Nagaraja Rao and Sri S. Thangavelu has already been taken up. In regard to Sri P. S. Murthi, further orders of Government are awaited.

APPENDIX 31—cont

Statement showing the cases of defalcations, etc., for the period ending 30th June 1961—cont.

Serial number.	Number of cases of defalcation pending at the beginning of the year under report.	Place of occurrence.	When the irregularities were noticed.	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—2 ..	1 Vellore (North Arcot district).	December 1956.	7,782 57	1956	..	The question of fixing responsibility for the deficits noticed in the Engineering Stores has not yet been finalised and is under investigation.	..	..
13	Do.	2 Saidapet (Chingleput district).	1956 ..	4,882 52	1949—54	..	The final report of the Assistant Agricultural Engineer (Inspection), Vellore, regarding the net loss sustained by Government is still awaited. The explanation of the Agricultural Engineering Supervisor concerned called for the deficits for which he was found solely responsible has not yet been received. He has been permitted to go to Vellore, peruse the records and submit his explanation soon.	..	..
							The exact loss sustained by the Government of Madras has been arrived at as Rs. 390-78	..	..
14	1957—1 ..	Vegetable Seed Stores (Madras district).	21st May 1957.	55 41	1957	..	Sri A. Ratnavelu concerned clerk was dismissed from service and no further action is pending in the matter. (This will be excluded in the next report.)	..	..
15	1958—2 ..	Tirturai poondi Depot (Thanjavur district).	1958 ..	44,878 00	1956—58	..	The report of the Collector of Thanjavur regarding the action taken against the persons concerned and the result of the Police case filed is still awaited.	..	..
16	Do.	2 Nedumbalam State Seed Farm (Pattukkottai, Thanjavur district).	1958 ..	1,595 79	1953	..	A Sum of Rs. 161-59 only remains to be recovered. Further action regarding the recovery of the above sum and reinstatement of the persons concerned in service is being taken up separately.	..	..
17	1959—3 ..	1 Jeeyapuram (Tiruchirappalli district).	1959 ..	541 25	1959	..	The amount is ordered to be recovered from the depot clerk at Rs. 25 per mensem and the recovery is in progress. The result of the Police complaint is awaited. The depot clerk is under suspension.	..	..
18	..	Agricultural Research Station, Palur, (South Arcot district).	14th February 1959.	1,278 00	1959	..	The Deputy Director of Agriculture, Madras, has taken up departmental action against the persons concerned. His final report about the explanations of the subordinates concerned	..	..

APPENDIX 31—cont.

Statement showing the cases of defalcations, etc., for the period ending 30th June 1961—cont.

Serial number	Number of cases of defalcation pending at the beginning of the year under report.	Place of occurrence.	When the irregularities were noticed.	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. NP.							
19	1959—60 ..	3 Srikalai (Thanjavur district).	5th February 1959.	4,916 52 1959	..	..	..	..	..
							is awaited, to take consolidated action. The police case ended in the acquittal of the clerk. An appeal was not considered fit by the Government.		
							The loss sustained by Government has not been regularised fully. A sum of Rs. 268-80 has been ordered for recovery from Sri P. Manickavasagam, Agricultural Extension Officer in 13 monthly instalments of Rs. 20 each. Only a sum of Rs. 128-80 has been recovered from him so far. Further to this the missing of books in library have not yet been accounted for. Action is pursued in the matter.		
20	Do. ..	4 Koliyanoor (South Arcot district).	1959 ..	1,688 68 1959	..	..	The services of Depot Clerk concerned has been dispensed with and the Agricultural Demonstrator concerned has	..	..
21	1959—65..	Andipatti (Madurai district).	1959 -	2,821 11 1959	..	..	been kept under suspension. Only an amount of Rs. 15 remains to be recovered. Final orders in the Departmental action taken against the Agricultural Demonstrator has not yet been passed. The matter is under examination.	..	..
							A total loss of Rs. 1,271-07 has so far been regularised. A sum of Rs. 15-49 has yet to be recovered from the Store clerk. Responsibility has been fixed on Sri N. G. Raj, Agricultural Extension Officer. The legal opinion on the feasibility of recovering this amount from the ancestral properties of the deceased, viz. Sri N. G. Raj has been sought for and a report on this is still awaited from the District Agricultural Officer, Madurai.	..	..
22	1960—65..	Tiruchirappalli (Tiruchirappalli District).	1960 ..	Not yet assessed.	..	..	Sri A. Swaminathan, Borewell Foreman absconded from 7th June 1960. A complaint has been lodged with the Police and the Police have since apprehended the store-keeper. The investigation has since been finalised and a preliminary report on the findings has been sent to Government in this office letter No. N. 4, 283/60, dated 9th November 1961.	..	..
23	..	2. Alanganallur (Madurai District).	October, 1959.	1,826 04 1959 Plus 887 32	-	..	The Stores valued for a sum of Rs. 30-49 are yet to be regularised. A police case was	..	..

APPENDIX 31—cont.

Statement showing the cases of defalcations, etc., for the period ending 30th June 1961—cont.

(1) Serial number.	(2) Number of cases of defalcation pending at the beginning of the year under report.	(3) Place of occurrence.	(4) When the irregularities were noticed.	(5) Amount involved.	(6) For what period the irregularities were kept unremedied.	(7) Number of cases disposed of during the year.	(8) Nature of action taken against the persons responsible.	(9) Number of new cases detected during the year.	(10) Remarks.
14	..	Dharmathupatti (Madurai District).	1960	..	1,443 73 1960	..	filed and all the accused were released. Departmental action is being taken on those who are suspected to be involved and the matter is under examination by the District Agricultural Officer, Dindigul. Sri P. Maruthanayagam, Agricultural Extension Officer has been held responsible to make good the amount of Rs. 559.37 and a sum of Rs. 50 in monthly instalment is being recovered from him from April 1960. Action is being taken to regularise the loss and the departmental action is also being contemplated against the persons concerned and the matter is under examination with the Commissioner, Panchayat Union, Dharmathupatti.	..	..

15	..	4. Vadipatti	October 1959.	517 18 1960	..	..	Certain items valued for Rs. 60-60 only has not been regularised. The matter is under correspondence with the District Agricultural Officer, Dindigul. No disciplinary action is contemplated in this case against any of the persons. a. The subject is not now pending since the amount has been recovered in full and appropriate punishment has been given to the person concerned. b. The details called for are still awaited and the matter is still under correspondence with the District Agricultural Officer, Cuddalore. The loss is being regularised and the matter is under examination by the Assistant Agricultural Engineer, Soil Conservation Scheme, Dindigul, and Ariyalur. A sum of Rs. 171.89 only has been recovered from the Depot clerk concerned. Sri P. Palani Velayudam, Depot Clerk, was held responsible for the misappropriation of the amount, and a sum of Rs. 5,481.54 has already been recovered from him and the clerk has been placed under suspension with effect from 11th December 1960. Departmental action has been taken against the clerk for awarding a suit.	..	..
26	..	b. Karinjipadi (South Arcot District).	January 1959.	a. 675 51 b. 2,100 00 (Approximate).	..	..	..	..	..
27	..	G. Perambalur (Tiruchirappalli district).	December 1958.	1,011 22 1958	..	..	..	..	..
28	1961-7	Nagerecoil (Nagerecoil District).	1960	..	5,663 67 1960	..	..	..	..

APPENDIX 31—cont.
Statement showing the cases of defalcations, etc., for the period ending 30th June 1961—cont.

Serial number. (1)	Number of cases of defalcations, etc., pending at the beginning of the year under report. (2)	The place of occurrence. (3)	When the irregularities were detected. (4)	Amount involved. (5)	For what period the irregularities were kept unremedied. (6)	Number of cases disposed of during the year. (7)	Nature of action taken against the persons responsible. (8)	Number of new cases detected during the year with details of the cases. (9)	Remarks. (10)
20	1961	.. Tiruppur (Coimbatore District).	11th Dec. 1960.	Value not furnished for 48 numbers of foliolet tubes.	—	..	ble punishment. Action was also taken against the Agricultural Inspector, Nagercoil for his default in checking and attesting the entries in the depot register, cash book, etc., and his increment has been stopped for one year without cumulative effect.	..	..
20	1	.. Tiruppur	.. 1961 (28th June).	2,000 00 1961	—	..	The shortages were made good by the depot clerk and further action is being pursued against him and the matter is under correspondence with the District Agricultural Officer, Coimbatore. The loss is reported to be less than Rs. 400.	..	..
						..	Three persons (outsiders) were charge sheeted by the Police and they were convicted to undergo rigorous imprisonment (Accused 1—3 months and Accused 2 and Accused 3 on appeal before S.D.M., Palladam.	..	..

31	1961	.. Vengenthattai (Tiruchirappalli District).	1961	.. 1,590 80 1960 2,651 56	..	..	Accused 2 and Accused 3 filed an appeal before S.D.M., Tiruppur and were acquitted on 27th August 1961. The P.O. Coimbatore is being consulted by the Block Development Officer, Tiruppur, in regard to filing of an appeal in the High Court.	..	..
						..	Sri A. J. Abdul Rasack, Depot Clerk, has been held responsible for the misappropriation and manipulation of accounts and he has been kept under suspension and the matter is under examination with the District Agricultural Officer, Musiri.	..	..
32	1961	.. Kaveripakkam (North Arcot District).	1959	.. 1,590 80 1959	..	..	Against the total loss, a balance of Rs. 81.76 alone has to be recovered yet. The services of the Fieldman concerned has been terminated. Further action is being pursued by the District Agricultural Officer.	..	..
33	1961	.. Thirunagall (Thanjavur District).	1960	.. 1,423 75 1960	..	..	The entire amount of loss has been realised and credited into Government Account. The Agricultural Demonstrator concerned has been kept under suspension and further disciplinary action against him is in progress.	..	..
34	1961	.. Badalur (Thanjavur District).	1961	.. 1,925 40 1961	..	..	The sum of Rs. 1,472.38 only has been recovered from the subordinate concerned. Further the disciplinary action has also been taken against the subordinate and the matter is under examination by the District Agricultural Officer, Thanjavur.	..	..

APPENDIX 32.

Statement showing the expenditure and receipts of the Agricultural Research Stations during 1960-61.

Name of the agricultural stations. (1)	Expenditure. (2)	Receipts. (3)
	RS. NP.	RS. NP.
Agricultural Research Station, Palur ..	63,549 06	33,581 97
Rice Research Station, Tirur ..	54,269 00	26,086 00
Agricultural Research Station, Tindivanam ..	80,220 00	15,484 00
Agricultural Research Station, Aduthurai ..	70,515 63	38,781 38
Agricultural Research Station, Pattukkottai ..	46,280 18	21,162 48
Agricultural Research Station, Koilpatti ..	55,028 45	17,052 62
Agricultural Research Station, Bhavanisagar ..	81,111 19	57,746 37
Banana Research Station, Aduthurai ..	40,113 77	12,687 00
Central Sugarcane Research Station, Cuddalore ..	1,74,437 76	75,872 30
Central Farm, Coimbatore ..	1,11,210 22	75,519 92
Botanical Gardens, Ootacamund ..	57,501 48	21,338 25
Sim's Park, Coonoor ..	18,892 22	14,114 41
Pomological Station, Coonoor ..	25,092 87	14,877 95
Fruit Research Station, Kallar ..	10,292 55	8,022 70
Fruit Research Station, Burliar ..	19,361 85	785 31
Groundnut Research Station, Pollachi ..	24,084 38	13,044 26
Rice Research Station, Ambasamudram ..	5,215 44	8,369 59
Agricultural Research Station, Paramakudi ..		

APPENDIX 33.

Statement showing the results of analysis of experiments conducted on Paddy I, II and III crops and combined paddy during the fasli 1370 (1960-61) in Madras State.

Serial number and Category of experiment.	Number of experiments.		Estimated average yield in terms of cleaned produce.		Estimated total Production in terms of rice.	
	Planned.	Considered for ana- lysis.	lb./acre.	kg./hectar.	'00 tons.	'00 tonnes.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Paddy I crop ..	786	591	1,237	1,386	24,650†	25,040
2 Paddy II crop ..	230	166	1,333	1,404	7,960†	8,090
3 Paddy III crop ..	24	14	1,107	1,240	550†	580†
4 Paddy (combined) ..	1,040	771	1,301	1,458	33,160†	33,690
5 Irrigated cumbu ..	120	22	668	749	..*	..*
6 Unirrigated cumbu ..	736	224	400	448	..*	..*
7 Irrigated oholam ..	180	45	1,065	1,194	..*	..*
8 Unirrigated oholam ..	558	188	585	655	..*	..*
9 Irrigated ragi ..	390	144	1,263	1,415	..*	..*
10 Unirrigated ragi ..	258	69	589	660	..*	..*

* 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 estimates of yield and production in respect of paddy are provisional and subject to revision, when the final area figures as per Season and Crop Report for the year 1960-61 become available.

APPENDIX 34.

Statement showing the results of analyses of experiments conducted on Paddy with three principal grow more food aids during the fasli 1970 (1960-61) in Madras State.

Serial number and Category of experiments.	Number of experiments.		Estimated additional yield of rice in lb./acre. kg./hec		Percentage sampling error.
	Planned.	Considered for analysis.	(4)	(5)	
(1)	(2)	(3)	(4)	(5)	(6)
1 Improved seeds ..	250	126	253	284	15.08
2 Green Manure ..	250	109	254	285	8.30
3 Ammonium Sulphate ..	250	111	269	302	6.81

APPENDIX 35.

Programme of work for 1961-62.

I. Paddy—(1) *Pureline selection*.—Pureline selection work will be continued at Coimbatore in Tiruchengode samba, at Aduthurai in Mattaikuruvai, at Pattukottai in Mattaikuruvai, Kodivellai, Kattaivellai and Kaivari samba at Palur in Sornavari, Seevan samba, Thuyamalli samba, Mottakar and Vellakar at Paramakudi in Kuliadichan, Pulithipiratti, Banku and Ramanathapuram varieties at Ambasamudram in Maikuruvai, Seenganai, Seembuli and Arikirayi at Tirur in Kuppam in Vadan samba, Kappa samba, Chinna samba, Kappa kar, Mottakar and Kessari and at Talainayar in Tiruthurai poondikar and Kattuvanam varieties. The promising cultures in the above varieties, will be tested in cultivators' holdings during 1961-62, besides conducting yield trials in the respective centres.

(2) *Hybridisation*.—1. The japonica x indica hybrid progenies which were under trial at Coimbatore, Aduthurai, Palur, Ambasamudram and Tirurkuppam will be further tested. The eight cultures received from Hyderabad will also be tested. A total number of 3,268 single plants obtained from eight sets of crosses between ASD. 1 and Japanese varieties will be studied.

2. Study of 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 at Coimbatore, Aduthurai and Tirurkuppam and also on the ryots' holdings.

3. *Specific crosses to combine useful characters*.—(a) The season and period bound progenies will be tested in the districts to evolve a cosmopolitan strain. The work will be continued at Coimbatore and Tirurkuppam.

(b) The progenies of the crosses made to combine the bunchy panicle and five grain characters of the hay types Kolamba and Zinnia with the profuse tillering habit of GEB. 24, will be studied.

(c) The GEB. 24 x Karunginny poothala progenies will be tested in the ryots' holdings to have confirmatory results.

(d) Cultures from the crosses made to improve the grain quality of Co. 23 will be tested in ryots holdings.

(e) The study on the evolution of cosmopolitan strains to reduce the number of strains under distribution will be continued.

(f) The progenies of ASD. 1 x ASD. 3, PTB. 10 x ADT. 16 and Co. 13 x ADT. 16 will be studied to induce the non-shedding character in ASD. 1.

(g) To induce non-lodging, blast resistance and good grain quality characters in ASD. 1 crosses will be made between ASD. 1 and other suitable parents and progenies studied.

(h) Yield trials of cultures on the isolation of high yielding blast resistant strains resembling PLR. 1 and Co. 19 will be continued.

(3) *Introduction*.—The world collection of types and varieties maintained at Coimbatore will be studied with special reference to their adaptability for direct introduction and also for hybridisation purpose. The district trials with the three short duration Chinese varieties and the Madhya Pradesh variety, i.e., Labhandi will be continued. Besides, the trial of strains evolved at other stations will be continued in all research stations to fix up the cosmopolitan ones.

(4) *Induction of mutations*.—The mutants derived from the strains by treatment with chemicals and X-rays will be multiplied and sent for trials in ryots' holdings.

(5) *Manurial experiments*.—The following manurial experiments will be conducted at different centres:—

(i) Varietal response to manuring experiment at Tirurkuppam and Palur.

(ii) Complex fertiliser experiment at Coimbatore.

(iii) Calcium ammonium nitrate experiment at Coimbatore.

(iv) Permanent manurial experiment at Aduthurai and Palur.

(v) The time of application of nitrogen experiment at Aduthurai and Ambasamudram.

(vi) Practical application of ammonium sulphate experiment at Palur.

(6) *Cultural experiments*.—(i) Presoaking experiment of paddy seeds in sodium bicarbonate solution at Coimbatore, Aduthurai and Palur.

(ii) Dibbling seeds adopting different spacing under dry conditions at Tirurkuppam.

(iii) Summer ploughing and broadcast sowing experiment at Ambasamudram.

(7) *Miscellaneous experiments*.—(i) Studies on natural crossing in rice at Coimbatore.

(ii) Devising and testing a simple apparatus to test the stiffness of paddy straw at Coimbatore.

(iii) Devise for testing root efficiency of paddy varieties in the seedling stage at Coimbatore.

(iv) Mixed cropping trials at Tirurkuppam.

(v) Seed rate experiment a broadcast crop of paddy at Paramakudi.

(8) *Schemes financed partly by the Indian Council of Agricultural Research*.—(i) *Evolution of superior blast resistant strains*.—The hybrid progenies will be tested for their resistance to blast disease. The pure breeding cultures will be put under yield trials. The most promising cultures will be tried in the districts. Study of types to fix up the resistant ones for future hybridisation work and the study on the relation between the time of planting and the disease occurrence will be continued.

(ii) *Evolution of drought resistant strains*.—The work will be carried out at two centres, i.e., Coimbatore and Tirurkuppam. The large number of hybrid progenies will be studied besides studying the dry and semi-dry paddy varieties collected from within the outside Madras State and other countries. The root system and the size and number of stomata in the leaf, stem and sheath in wet and dry rices will be continued.

(iii) *Evolution of superior short-term strain of paddy possessing seed dormancy*.—The items of work will consist of laying out comparative yield trials with the promising cultures, 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 work will be continued at Coimbatore and Aduthurai.

(iv) *Evolution of strains for inundated areas*.—The work will be continued at the Deep-water Rice Research Station, Talainayar, Thanjavur district. The work consists of studying the promising pure breeding cultures in yield trials in the stations and also in the cultivators' holding. Paddy varieties received from outside will also be tested in actual deep-water conditions for introduction.

(v) *Evolution of saline and alkaline resistant paddy strains*.—The work will be pursued at Alkaline Resistant Rice Research Station, Peravurni, Thanjavur district. Study of the saline resistant varieties received from within and outside Madras and other countries in actual saline conditions, screening of the large number of hybrid progenies for saline resistance, study of the homozygous cultures in yield trials, study of the F1 seeds obtained from the crosses effected between departmental strains and the reputed saline resistant varieties SR. 26 B and T. 892 and study of the root, stem and leaves of both the susceptible and alkaline and saline resistant varieties to correlate anatomical structures with saline resistance character are the items of work proposed to be made during 1961-62.

II. Millets.—(a) *Millet Breeding Station, Coimbatore—Cholam*.—(1) Maintenance of Germ Plasm bank.

(2) Periamanjil cholam—Improving the quality of straw by hybridization.

(3) Talaivirichan cholam—Improvement of grain yield.

(4) Sen cholam—Evolution of high yielding juicy stalked Sen Cholam strain.

(5) Evolution of a high yielding pink grain strain.

(6) Vellai cholam—Evolution of high yielding juicy stalked strains with pure white grains.

(7) Studies on the quality of grains of improved strains and varieties of Sorghum grown in Madras State.

(8) Studies on the quality of straw of cholam strains.

Cumbu.—(1) Maintenance of germ plasm bank.

(2) Evolution of early maturing high yielding cumbu strains short in stature and possessing thick poduncle and long earheads.

(3) Studies on synthetics and polycrosses.

(4) Improvement of quality of straw in cumbu.

Ragi.—(1) Maintenance of germ plasm bank.

(2) Evolution of short duration strains in ragi.

(3) Evolution of high yielding white grained ragi strains having high protein and vitamin content.

(4) Studies on quality of grain of ragi.

Minor millets.—(1) Maintenance of germ plasm bank.

(2) Evolution of rust resistant strains of Ttnal.

Pulses.—(1) *General pulses.*—Maintenance of germ plasm bank.

(2) *Redgram.*—Evolution of high yielding strains (long duration group).

(3) Evolution of short duration redgram strains.

(4) Evolution of high yielding perennial strains of redgram by selection.

(5) *Coupea.*—Evolution of high yielding strains in dry land varieties.

(6) *Sul Clusterbeans.*—Collection of types and selection of a strain superior to C.P. 78.

(7) Indian Council of Agricultural Research Scheme for Dolichos lablab.

(b) *Agricultural Research Station, Koilpatti—Cholam.*—(1) *Irung cholam—Bainfed.*—To evolve a grain gum fodder, strain with bold grains suited to the southern districts.

(2) *Vellai cholam.*—Evolution of a strain shorter in duration than Cholam K. 2.

(3) Indian Council of Agricultural Research Scheme for the evolution of Drought Resistant strains in Sorghum.

Cumbu.—(1) Exploitation of hybrid vigour in cumbu for economic purposes.

Ragi.—(1) Isolation of high yielding short duration ragi strains.

Kudiraivali.—(1) Improvement of Kudiraivali.

Chillies.—(1) Indian Council of Agricultural Research Scheme for the improvement of chillies in the Madras State.

III. Oil seeds.—(a) *Groundnut.*—(1) Study of qualitative characters of groundnut, both bunch and spreading, raised in important growing regions of the State.

(2) Study on the storage of groundnut oil.

(3) Comparative yield trials with five selections of the spreading variety.

(4) Preliminary yield trials with six selections of the spreading variety.

(5) Replicated row test with 36 selections of the spreading variety.

(6) Seed multiplication of two selections of the spreading and one of the bunch variety.

(7) Maintenance of Germ Plasm Bank.

(8) Study of inheritance of characters—24 crosses and 35 progenies of F. 2.

(9) Manurial-cum-Varietal and spacing trial in both spreading and bunch variety.

(10) District trials with 14 promising selection.

(11) Maintenance of Germ Plasm Bank and testing the varieties for their suitability to the tract.

(12) District trial with three bunch selections.

(13) Comparative yield trial with four red seeded selections.

(14) Replicated row test with 196 selections.

(15) Study of progenies of earlier crosses.

(16) Spacing experiment with bunch variety.

(17) Hybridisation and yield trials under Intensive Breeding Scheme.

(b) *Gingelly.*—(1) Maintenance of Germ Plasm Bank.

(2) Trial to evolve high yielding strains in different stages of yield trial.

(3) Hybridization to evolve non-dehiscent high yielding type.

(4) Comparative yield trials with five selections during 1961-62 cold weather and with five selections during 1962 summer.

(5) Preliminary yield trial with four selections.

(6) Replicated Row Test with six selections.

(7) Study of 57 selections from the F₂ and F₃ progenies.

(8) District trial with improved selections.

(9) Comparative yield trial of three strains from other States, three local varieties from Tiruchirappalli district, three strains evolved at Tindivanam, nine local samples, two mass selections, two Bombay strains and two promising selections from Coimbatore and Tindivanam.

(10) Replicated Row Test of 75 selections.

(11) Items of investigations envisaged under the Intensive Breeding of Sesamum Scheme, Karur.

(c) *Castor.*—

(1) Maintenance of Germ Plasm Bank.

(2) Genetic studies to find out the mode of inheritance of number of nodes and jassid resistance.

(3) Evolution of a perennial castor for the plains collection of local perennials and hybridisation work.

(4) Study on the efficiency of the materials used for bagging castor heads to prevent cross pollination.

(5) Comparative yield trials with five medium duration varieties.

(6) Preliminary yield trial with four short duration varieties.

(7) Replicated Row Test with six selections.

(8) District trial with five short duration selections.

(9) Items of investigation envisaged in the Technical Programme of the Hybrid Castor Scheme.

(d) *Safflower and Niger*.—Items envisaged in the Safflower and Niger Scheme at Koilpatti and Hosur.

(e) *Coconut*.—Items envisaged in the Technical Programme of the scheme for establishment of the Regional Coconut Research Station, Veppankulam.

IV. *Cotton*.—A. *Cotton Breeding Station, Coimbatore*.—I. Evolution of Cambodia strain suitable for irrigated and unirrigated winter cambodia region of Madras State.

II. Utilization of wild germ plasm.

III. Synthesising Asiatic and American Cottons.

IV. Germination and Seed Viability studies.

V. Breeding for marker gene.

VI. Inheritance of characters.

VII. Study of heterosis.

VIII. Cytogenetic investigations on *Gossypium*.

IX. Germplasm Bank.

X Perennial Cottons—Screening.

XI. The effect of Nitrogenous, Potash and Phosphatic fertilizers on cotton at Coimbatore, Srivilliputhur and Kovilpatti.

XIII. Defoliation studies on cotton.

B. *Agricultural Research Station, Bhavanisagar*.—(1) Varietal trials of desi and American cottons under the Lower Bhavani Project.

(2) Time of sowing trial with the new strain MCU. 3 at Bhavanisagar.

C. *Agricultural Research Station, Kovilpatti*.—Scheme for the improvement of Tirunelveli and Karunganni Cotton in Madras State at Kovilpatti.

D. *Cotton Research Farm, Srivilliputhur*.—(1) Scheme for the production of an extra long staple cotton of 1-3/16 inches in Madras State at Srivilliputhur.

(2) Effect of mulching with polythelene film on cotton at Kovilpatti and Srivilliputhur.

V. *Sugarcane—Agronomy*.—(1) Varietal study.

(2) Preliminary yield trial of early varieties I and II series.

(3) Main yield trial of early varieties (ratoon).

(4) Maturity observation of early varieties (Ratoon).

(5) Special season varietal trial.

(6) Adsali Hawaiian trial.

(7) Main season: Hawaiian trial.

(8) Nitrophoska experiment.

(9) Alternate source nitrogen experiment.

(10) Adsali graded dose of nitrogen trial.

(11) Adsali split dose of nitrogen trial.

(12) Mulching experiment.

(13) Weedicide trial.

(14) Phytohormone experiment.

(15) Foliar application of nitrogenous fertilizer to sugarcane.

Chemistry.—(1) Nutrition of sugarcane.

(2) Phosphate carrier experiment.

(3) Routine juice analysis from different experiments.

(4) Analysis of farm soils.

(5) N.P.K. experiment.

Entomology.—(1) Studies on sugarcane borers—Assessing incidence, conducting insecticidal trial, Biological studies, natural enemies and Insect Pest Scheme experiments.

(2) Observation on incidence on minor pests on sugarcane.

(3) Survey of sugarcane pests.

Mycology.—(1) Smut varietal resistance trial.

(2) Fungicidal trial against pine apple.

(3) Studies on minor diseases.

(4) Smut varietal ratoon trial.

(5) Survey of sugarcane diseases.

VI. *Horticulture*.—(1) *Pomological Station, Coonoor*.—(i) Continuance of rootstock trials in apple, plum and peach.

(ii) Monthly propagational trial in persimmon.

(iii) Trial on grafts versus seedlings in Cherinoyer.

(iv) Introduction and trial of new kinds and varieties of fruits and other horticultural crops.

(v) Sandolin 'A' spraying trials in plums.

(vi) Study of flowering in passion fruit.

(vii) Introduction and trial of essential oil yielding plants as well as new horticultural crops.

(2) *Kallar and Burlar Fruit stations*.—(i) Propagational trials in patchouli, jack, breadfruit, and mongosteen.

(ii) Hybridisation in Citrus, Annona, Pine apple and passion fruit.

(iii) Rootstock trials in Citrus, jack, custard apple and durian.

(iv) Study of performance of patchouli and vetiver.

(v) Study of progenies in mangosteen, mandarin orange and jack.

(vi) Selfing in pummelo.

(vii) Study of flowering and fruiting in yellow passion fruit and giant granadilla.

(viii) Introduction and trial of new kinds and varieties of horticultural crops.

(3) *Agricultural Research Station, Nanjanad*—(1) *Manurial experiment*.—(i) Studies on the interaction between the quantity of fertilisers applied and seed size, (ii) studies to evaluate the optimum fertiliser requirements of a few popular potato varieties on the Nilgiris.

(2) *Cultural experiments*.—(i) Studies on the effect of various inward slopes on the yield and incidence of brown rot, (ii) studies on the effect of mixed cropping on the yield of potato.

(3) *Miscellaneous experiments*.—(i) Studies on the effect of Malele hydrazide as a sprout inhibitor, (ii) studies on the effect of leaf roll and mosaic viruses on the yield.

(4) Studies on the performance of bolter plants in comparison to normal plants in great scot variety.

(4) *Botanic gardens, Ootacamund and Sim's Park, Coonoor*.—(i) Plant introduction studies with new kinds of ornamental and economic plants.

(ii) Continuance of seed viability studies.

(iii) Continuance of studies on growth and flowering of six orchids.

(iv) Continuance of selection and seed or plant multiplication studies in *Amaryllis* and *Begonias*.

Sim's Park, Coonoor.—(i) Continuance of plant introduction studies.

(ii) Continuance of basic information on growth and flowering in selected annuals.

(iii) Continuance of selection and seed or plant multiplication of *Dahlia* and *Gladiolus*.

(5) *College Orchard, Coimbatore*.—(i) Study of regional performance of grape varieties.

(ii) Study of water requirement.

(iii) Studies on the effect of foliar spray of nutrients on vegetables.

(iv) Improvement in papaya.

(v) Pruning trial in guava and fig.

(vi) Studies on papain extraction.

(vii) Study of new introductions and economic species of horticultural crops.

(viii) Studies to determine the optimum stage of harvest in tapioca and sweet potato.

(ix) Studies on the yield, quality and consumer appeal of promising types of sweet potato and tapioca.

(6) *Scheme for research on clove, nutmeg and cacao*.—(i) Studies on clonal progenies of in-clove, nutmeg and cacao.

(ii) Propagational trial in clove.

(iii) Studies on the performance of grafts on various rootstocks in nutmeg.

(iv) Studies on determination of suitable shade plants and the optimum pruning treatment in Cacao.

(v) Studies on optimum method of curing of cacao beans.

(7) *Scheme for research on the improvement of vegetable, Coimbatore*.—

(i) Continuance of comparative yield trials in brinjal, bhendi and tomato.

(ii) Hybridisation studies in brinjal and radish.

(iii) Hybrid vigour studies in brinjal and bhendi.

(iv) Blossom biological studies in snakegourd.

(8) *Scheme for the improvement of perennial vegetables, Coimbatore*.—(i) Survey and selection of promising types in drumstick, perennial ash gourd, *Coccinia*, Chekurmanis and Chowchow.

(ii) Introduction and trial of types and isolation of promising types for distribution.

(iii) Determination of optimum manurial practices in drumstick and chowchow.

(iv) Vegetative propagational studies in drumstick, *Coccinia* and Chekurmanis.

(v) Seed viability studies in drumstick and perennial ashgourd.

(vi) Studies on pests and diseases on the crops included under the scheme.

(9) *Banana Research Station, Aduthurai*.—(i) Taxonomic studies.

(ii) Hybridisation studies.

(iii) Study of Mutants and selections.

(iv) Trials on desuckering, manuring, irrigation, spacing, cultural, practices, etc.

(v) Fundamental studies on root system, fruit development and suckering habits in various varieties.

(10) *Fruit Research Station, Periakulam*.—(i) Varietal collection in mango, citrus and grape.

(ii) Rootstock trial in mango, citrus and grape.

(iii) Manurial trial in mango citrus and grape.

(iv) Blossom biological studies in mango.

(v) Trial on off-season bearing mangoes.

(vi) Study of bud-sports in citrus.

(vii) Trial on orchard cultural practices in citrus.

(viii) Collection of nucellar seedlings.

(ix) Irrigation trial in grapes.

(x) Trial on thinning in grapes.

(xi) Study of economics of cultivation in mango, citrus and grape.

(xii) Studies on picking, packing and storage in grape.

(xiii) Varietal collection in annonas, guava, sapota, jack, fig, pomograte, etc.

(11) *Scheme for research on apples at Kodaikanal*.—(i) Introduction and trial of varieties for isolation of promising performers.

(ii) Propogational investigations.

(iii) Rootstock investigations.

(iv) Manurial trial.

(v) Trial in breaking the rest period and in increasing the fruitset.

(vi) Studies on picking, packing and storage.

(12) *Scheme for the maintenance and propagation of seeds and bulbs of imported ornamental plants at Ootacamund*.—(i) Continuance of survey and collection from within the country and also abroad and isolation of promising types.

(ii) Study of varietal characteristics of the various selections.

(13) *Scheme for stabilisation of off-season bearing in mango at Kinga kumari*.—(i) Varietal studies.

(ii) Study of individual tree performance.

(iii) Progeny tests.

(iv) Trial of polyembryonic rootstocks.

(v) Study of cultural practices.

(vi) Fertiliser experiments.

(vii) Biometric studies.

VII. Entomology—(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 Dieldrin, etc., will be taken up.

(2) *Fixing up a schedule of treatments against the pests of paddy*.—Field experiment will be continued to arrive at a suitable prophylactic schedule of treatments necessary to give relief against all the pests of paddy.

(ii) *Pests of Millets*: (1) *Cholam Stem-borer* (*Chilo zonellus* S).—Continuation of the current years experiments, Sprays of Folidol, Endrin, Aldrin, Dieldrin, will be tried and studies on bionomics continued.

(iii) *Pests of Cotton*—(i) *The leaf roller* (*Sylepta derogata* F).—Potentialities of the new chemical will be studied.

(2) *Fixing up a schedule of treatments against the pests of Cotton*.—As in the case of paddy here also the optimum No. of applications required to control the major pests of cotton will be worked out.

(iv) *Pests of Oilseeds*—(1) *The castor semilooper*; (*Achoea janatha* L).—Investigations on the control of the pest with various chemicals such as Aldrin, Dieldrin, Folidol and Basudin to be taken up.

2. *The castor alcyonodid*—(*Trialeurodes ricini* M).—Studies on the life history alternate host, natural enemies and control measures with new chemicals to be pursued.

3. *The castor shoot and . . . pod borer*; (*Bischocrota punctiferata* 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.

4. *The red-hairy caterpillar of Groundnut* (*Anisacta albistriga* M).—The studies on the usefulness of the recent chemicals in controlling the pest will be undertaken.

(v) *Pest of fruits*—(1) *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.

(2) *Studies on the teamosquito bug on guava* (*Helopeltis antonii* S).—Studies on an observational basis will be conducted to evolve suitable control measures.

3. *Pests of tamarind*.—Studies on the seasonal incidence, bionomics and control of the pests affecting the tamarind will be pursued.

(vi) *Pests of tuber crops*—(1) *Tapioca scale* (*Aonidomytilus albus* CKH).—Intensive studies will be taken up on the life history and suitable control measures will be attempted to be evolved.

(2) *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.

(vii) *Soil insecticides and Earthworms, etc.*—(1) *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.

(2) *Economic aspect of Earthworms*.—Investigations on the usefulness of earthworms in enriching the soil will be continued.

(viii) *Pests of stored products*.—Studies on the correlation between the insect infestation and moisture content will be continued.

(ix) *Biological control*—(1) *Biological control studies on some indigenous coccinellids*.—Studies on the potentialities of the indigenous coccinellids in the field of biological control will be continued.

(x) *Studies on Indigenous Plant Products*.—(1) *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 utilising them in the control of insect pests.

(xi) *Phytotoxicity studies on synthetic insecticides*—(1) *Adverse effects of insecticides*.—Studies on the adverse effects of pesticides on various groups of plant will be continued.

(xii) *Bee-keeping*—(1) *Selective breeding of Queen Bees*.—Investigations on the possibility 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.

(2) *Studies on swarm control methods*.—

(3) *Studies on the different types of hives*.—

(xiii) *Fundamental studies*—(1) *Rearrangement and re-classification of the Insect Collections*.—The re-arrangement and systematic reclassification of the insects will be continued.

(2) *Bionomics of important coccinellids predasepus on aphids and scales*.—Studies on *Clanis pubescens* M and *Scymnus Pubilis* M will be continued.

(xiv) *Pests of Ornamental Plants*—(1) *Pests of rose*.—Studies on the seasonal incidence and bionomics of the pests affecting rose will be continued.

(xv) *Mites as crops pests*.—Information on the biology of mites and their control will be gathered.

(xvi) *Pests of pulses*.—Studies on the bionomics and morphology on the major pests affecting pulses will be continued.

(xvii) *Pests of vegetables*—(1) *Pests of cruciferous vegetables*.—The bionomics and control of various pests affecting the cruciferous vegetables will be studied.

(xviii) *Pests of green manure crops*.—Pests affecting Gliricidia and Sunnhemp will be continued.

Schemes:—

(1) Paddy Stem-borer Scheme, Aduthurai.

(2) Scheme for Research, on Toxicology and advert. effects of synthetic pesticides.

(3) Vegetable scheme

(4) Scheme for study on field rates.

(5) Sugarcane insect pests scheme, Cuddalore.

These four schemes are financed by the Indian Council of Agricultural Research and the work will be carried out as per the technical programme.

Scheme financed by the Indian Central Sugarcane Committee and the work will be carried out on the items chalked out in the technical programme.

VIII. Mycology—(1) *Paddy blights Piricularia oryzae*.—(i) Varietal resistance studies with short, medium and long duration paddy cultures will be continued.

(ii) Fungicidal trial with various proprietary fungicides will also be continued to find out the efficacy of the fungicides in the control of blast disease.

(iii) The existence of physiological races in *Piricularia oryzae* will be studied.

(iv) Screening the various short duration types maintained by the Paddy Specialist for their relative resistance to blast disease will also be continued.

(2) *Helminthosporise of paddy—Helminthosporium oryzae*.—(i) The relative efficacy of the various fungicides will be tested in the control of the disease.

(ii) Survey of important paddy areas in the state and collection of diseased specimens for isolating the fungus for further studies.

(iii) Rice cultures available with the Paddy Specialist will be screened for their resistance to *Helminthosporise*.

(3) *Ragi Blast—Piricularia sp.*—(i) The relative efficacy of the various fungicides in the control of the disease both in the nursery and in the transplanted crop will be assessed.

(ii) The varietal resistance studies will also be continued.

(4) *Sorghum Leaf Diseases*.—(i) The casual fungi will be isolated from diseased specimens collected from different parts of the State.

(ii) Varietal resistance studies will be continued.

(iii) The efficacy of the various fungicides in the control of the two diseases will be tested.

(5) *Anthraxnose of leguminosae*.—(i) Varietal resistance studies will be continued.

(ii) Identification of various isolates of *Collectotrichum* obtained from different leguminous plants will be continued.

(iii) Study of the perfect stage of anthracnose fungi will be continued.

(iv) Testing the efficiency of seed treatments in the control of seed borne infection will be continued.

(6) *Virus diseases of legumes*.—(i) Survey in all districts for the occurrence of virus diseases of leguminous crops estimating the severity.

(ii) Transmission studies with sap, insects, seeds, soil and grafting.

(iii) Varietal susceptibility will be tested with the available varieties.

(iv) Host range of the viruses will be studied.

(v) A culture of the viruses will be maintained on suitable host plants.

(vi) Control methods will be tried by the application of insecticides in cases where an insect vector is found responsible for transmitting the disease.

(7) *Brown-rot of Potato (Pseudomonas solanacearum)*.—(i) A survey of the incidence of the disease in the Nilgiris and Kodaikanal will be undertaken.

(ii) The chemical method of control will be continued.

(8) *Black arm of cotton (Xanthomonas malvacearum)*.—(i) The efficacy of the different antibiotics and fungicides will be assessed in the control of the disease.

(9) *Studies on pythiaceae fungi*.—(i) Evolving control measures for "damping off" on a field scale by—(a) Soil treatment with fungicides.

(b) Seed treatment with fungicides.

(ii) Testing the resistance of different varieties of vegetable crops like brinjal, chilli, tomato, bhendi will be undertaken.

(10) *Coconut Wilt—Ganoderma Lucidum*.—(i) Isolation and study of the pathogenic fungus from freshly infected material will be continued.

(ii) Survey of the Chief Coconut growing tracts of the State and recording the prevalence and intensity of coconut wilt.

(iii) Observations on the epidemiology of the disease will be made so as to devise control measures.

(11) *Seed borne fungi of cereals*.—(i) Survey of seed borne microflora of paddy, eumbu, Ragi, and cholam seeds will be continued.

(ii) Isolation of large number of seed borne fungi using malt salt agar.

(iii) Effect of various microorganisms on seed germination and seedling vigour.

(iv) Study of factors that contribute for seed spoilage during storage under different temperature and humidity conditions.

(v) The effect of seed treatment with chemicals on the control of various seed borne organisms under pot culture conditions.

(12) *Bacteriology*.—(i) Microbiological survey of soils of the three districts of Nilgiris, Thanjavur and Tiruchirappalli will be taken.

(ii) Pot cultures and laboratory studies for isolation of effective strains or Rhizobia for red gram will be continued.

(iii) Supply of bacterial cultures to community development blocks will be arranged.

(13) *Scheme for Investigation of Stem-Rot of Rice*.—(i) Varietal resistance studies will be continued.

(ii) Study of control measures—(a) Effect of application of Nitrogen, potash and phosphorus in graded doses and in combination will be studied under field conditions.

(b) Effect of application of soil fungicides in the control of the disease will be continued under field conditions.

(iii) Laboratory studies:

(a) Isolation of the fungus from specimens collected from different parts of the State will be continued.

(b) Morphological and cultural characters of the fungus will be studied.

(14) *Investigation of betel vine wilt in Madras State*.—(i) Trials on the efficacy of different fungicides in the control of the disease will be continued.

(ii) The relative resistance of the different varieties against wilt disease of betel vine will be tested.

(iii) The resistance or susceptibility of root stocks of wild species of *Pepper* would be determined by artificial inoculation. Grafting of betel vine on resistant root stocks if any would be attempted.

(15) *Scheme for the investigation of fusariase wilt of solanaceous vegetables*.—(i) Survey of the vegetable growing areas in Madras State for assessing the wilt incidence in brinjal, tomato and chilli will be continued.

(ii) Isolation of the pathogen from the wilted specimens and testing their pathogenicity.

(iii) Morphological and cultural characters of the isolates will be recorded.

(iv) Cross inoculation studies will be done with the different isolates.

(16) *Scheme for the study of nitrogen fixing blue green algae in rice soils of Madras State*.—(i) Techniques will be worked out for large scale multiplication of *Tolypothrix tenuis*.

(ii) Effect of addition of alga to the soil on the yield of rice under pot culture conditions.

(iii) Survey of South Indian Soils for the occurrence of nitrogen fixing cyanophyceae and their identification.

(17) *Scheme for the investigation of banana diseases in Madras State*.—(i) *Panama wilt (Fusarium oxysporum f. cubense)*.—Varietal resistance trials—All the important varieties of banana, wild species of *Musa* and hybrid bananas available with the Banana Research Officer at Aduthurai will be tested for resistance to wilt incidence.

Control.—(a) Application of various fungicides in the form of dust and wet treatments for the control of the disease.

(b) Effect of flooding the fields on the incidence of wilt will be studied.

(ii) *Anthraxnose (Gloeosporium musarum)*.—(a) Varietal studies on important varieties of banana will be tested for their resistance under laboratory and field condition.

(b) Determination of susceptibility in relation to age and ripening of the fruits.

Besides the above items, survey of banana growing tracts, isolation of casual organisms and pathogenicity tests with different isolates of *Fusarium* will be continued.

(18) *Scheme for Research on Fungicides*.—Efficacy of the fungicides listed below will be tested on a field scale for the control of the following diseases of crops :—

(i) *Paddy Blast (Spray trials)*.—Fungicides and their doses.—Fytolan 0.25 per cent, Shell copper 0.3 per cent, copper sandoz 0.35 per cent, Fungi copper geigy 0.33 per cent, Copper oxychloride 0.35 per cent, Fungimar 0.8 per cent, Cupramar 0.3 per cent, Vitigran 0.4 per cent, Bordeaux mixture 0.8 per cent and control.

Number of sprays—Four.

(ii) *Leaf spot of paddy (Seed Treatment trials)*.—Fungicides and their doses.—New improved Cereasan 0.07 per cent, Cereasan 0.22 per cent, Tillex 0.2 per cent, Phygon XL 0.14 per cent, Arasan 0.28 per cent, Spergon 0.28 per cent, Agrosan G.N. 0.28 per cent, Flit 406, 0.22 per cent, 2 per cent Cereasan 0.22 per cent and control.

Size of plot—4 feet by 10 feet.

IX. *Soil science*.—Under the onion exchange studies it is proposed to study the relation between anion exchange capacity, available phosphate, exchangeable phosphate, in black, red and laterite soils of Madras State. To study the physico-chemical properties of red and black soils of Madras State, soil samples (red and black) will be collected from different places and pot culture work will be carried out during the period under report. To assess the available phosphorus of soil during crop growth and to study the factors influencing it, field experiment will be conducted on cholam crop.

Under the scheme for reclamation of saline and alkaline land field experiments with various soil amendments at different doses will be continued and the best ameliorants with economic doses suited to different tracts of Madurai, Ramanathapuram and Tirunelveli districts will be selected for recommendation on large scale. Under the Scheme for reversion of phosphate in laterite soils of Nilgiris, observational trials with 150 lb. phosphoric acid in the form of silico phosphate in plots of about 2 cents will be taken to study the effect of reduced dosage. Analysis of post-harvest, surface and sub-soil samples and plant materials (Lupin leaf and whole plant) will also be carried out.

Detailed field examinations of soils in the alkali affected areas of the ayacut will be continued under the Amaravathy Reservoir Project Soil Survey Scheme. The study of variations in quality and level of the ground water from observation wells fixed for this purpose will also be continued under the Parambikulam, Upper Aliyar Project, Soil Survey Scheme, a detailed soil survey will be made and several surface and profile soil samples and water samples will be collected for a detailed laboratory examination. Under the Indian Council of Agricultural Research Scheme for maximization of phosphate potential in soils of Madras State duplicate profile samples will be collected from Coimbatore Centre (Red Soil) and field and pot-culture experiments will be conducted at Nanjanad on potato and lupin respectively using different forms of phosphate at various levels. At Kovilpatti observational trials will be laid out with sunnhemp and cumbu crop.

To study the continuous effect of cropping in soil manured with cattle manure and artificials supply nitrogen, phosphorus and potash singly and in combination continuously year after year in the same plots experiments will be continued in the old and New Permanent Manurial plots. For this study in the cold permanent manurial plots (CO. 1) will be taken up and Ragi (CO. 11) for the New Permanent Manurial Experiments. To find out the use of basic slag as a phosphatic manure with different forms of phosphates as one of the treatments at different levels of 'P' on paddy experiments will be conducted as soon as the basic slag is received. With a view to correlate the results of analysis by the rapid methods with those of the traditional methods a detailed analysis of soils by both the methods will be continued to a definite conclusion.

Under the scheme for the research on the storage of seeds and cakes of groundnut, studies will be continued (on similar line as previous year) to confirm the results so far obtained. Insect, pests and diseases found during storage will be identified and control measures will be adopted.

X. *Botany*.—(a) *Botany Main*.—(1) Studies on introduction and acclimatization and of economic plants and their relatives.

(2) Studies on the germination and dormancy of some south Indian vegetable and green manure seeds.

(3) Pre-treatment of grass seeds for improving germination.

(4) Germination studies in flowering annuals.

(5) Longevity studies in weed seeds and propagules.

(6) *Weed control by herbicides*.—Routine research items and observational trials of green manure plants, fibre crops, medicinal plants and other economic plants will be continued. Seed testing aspects will be strengthened, by laying emphasis on purity dormancy and other factors also.

(b) *Cytogenetics*.—(1) Study of cytology and cytogenetics in *Oryza*.

(2) Cytogenetical studies in *Pennisetum* and *Sorghum*.

(3) Collection of wild species of Vitaceae.

(4) Cytology of Vitaceae.

(5) Induction of polyploidy in cultivated grapes.

(c) *Plant physiology*.—Field studies will be conducted on paddy with parallel pot culture studies on foliar nutrition with major nutrients.

Pre-soaking the seeds of paddy in sodium bicarbonate solutions will be attempted with a view to increase the yield.

Studies to test the efficacy of Gibberellic acid both as a pre-soaking agent and foliar spray and other hormones as foliar sprays will be conducted on paddy, redgram gingelly in the laboratory and green house.

(d) *Fodder Research Scheme*.—(i) Maintenance, study and collection of grasses and legumes both from within the country and outside.

(ii) Yield trial with three grasses under irrigated conditions and with twelve grasses under rainfed conditions will be conducted.

(iii) Yield trial of grasses when grown alone and in combination with legumes both under irrigated and rainfed conditions will be conducted.

(iv) Manurial trial with (1) four grasses and ten treatments and (2) Lucerne with five treatments will be continued.

(v) Introduction of promising leguminous fodder and studying rotations. In a two-year crop rotation of ragi—Fallow—

Fallow	Sea Mays	Cotton.
"	Cholan	Cotton.
"	Pennisetum pedicellatum Cotton.	

legumes like pillipesara and sunnhemp will be introduced during the fallow period. A crop of cotton will be raised during 1961-62.

(vi) Trial of short duration fodder grasses grown alone and in combination with legumes under rainfed conditions. *Sorghum* and *Pennisetum pedicellatum* will be grown alone and in combination with 5 (five) legumes.

(e) *Cytogenetics (Fodder grasses—Scheme)*.—(1) Further collection and maintenance of useful indigenous forage species of grasses.

(2) Comparative study of the morphological characters of different collections and isolation of eco and biotypes with reference to productivity, draught and disease resistance.

(3) Study of cytology of species and inter-specific hybrids.

(4) Study on the extent of pollen and seed sterility of species.

(5) Inter-specific hybridisation and investigation of technicians of crossing.

(f) *Scheme for micronutrient studies on crop plants.*—Work during the period will be confined to laboratory and pot culture studies. Under laboratory analytical work on standardisation of estimation of micronutrients in plant and soil will be done. Experiments will be conducted under controlled conditions in pot cultures on paddy, chillies and brinjal, to study the effects of micronutrients on growth, flower production and yield.

XI. *Meteorology section.*—(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 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 conditions, 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 *Mezhichelvam*.

(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 popularised.

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 popularised 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.

Publicity.—The Grow More Food journals in the regional languages will continue to be published in the improved style. The Villagers' guide and calendar will be published in the regional language. Pamphlets on agricultural subjects will be distributed to farmers on all occasions like festivals, fairs and shandies. Popular hand-books will be published on agricultural subjects. Radio talks on agricultural subjects will be arranged to be broadcast in the Rural Services of All-India Radio. Agricultural New Letter and Press Notes will be continued as periodical features.

Exhibitions.—Exhibitions and shows will be organized at the districts at the time of festivals, fairs and shandies and demonstrations of improved implements and machinery and preservation of fruits will be conducted.

Agricultural Engineering (General).—The Intensive Cultivation Engineering Schemes will be continued to reach targets fixed. Supplies and services to agricultural machinery will be maintained.

Tractors.—Land reclamation with tractors and mechanical equipment, ploughing farmer's lands by tractors on hire and supply of tractors on hire purchase basis. Trial with various agricultural implements and machinery will be continued.

Irrigation appliances.—Hiring of oil engines and sale directly through firms will be continued. Supplies of electric motor pump-sets will be continued, river pumping will be expanded.

Tube-wells.—The sinking of filter-point tube-wells will be intensified to utilise subsoil water effectively in summer and pre-monsoon periods with a view to raise more crops.

Hire-purchase (C.A.E.S.).—Oil engines and electric motors pump-sets will be distributed on hire purchase basis to aid poor cultivators to take power-lift irrigation and raise crops profitably.

Soil conservation.—Soil conservation measures will be adopted as per approved programme and schemes under the Second Five-Year Plan will be executed during the year.

Hillmen Uplift Schemes.—Aids to poor and backward hill tribes of Nilgiris to facilitate their farming profitably will be continued.

Projects.—Crop planning for farmers in the new irrigation projects ayacuts will be done through experimental work in the Agricultural Stations in the area.

Crop competitions.—Crop yield competitions to enthuse farmers to raise larger crops will be conducted in all districts.

Agricultural marketing.—Market survey reports will be made up to date. Grading work on rice, eggs, ghee, fruits and other products will be amplified and continued. Establishment of regulated markets and expanding market facilities in the notified areas will be done. Help, advice and guidance will be extended to the Market Committee. Market reports, prices, statistics, reviews of market conditions will be continued. Advice on general marketing matters will be given to other departments and co-operative marketing will be encouraged.

APPENDIX 36.

Glossary.

Apple	..	<i>Pyrus Malus.</i>	..	Lime	..	<i>Citrus aurantiifolia.</i>
Arecaut	..	<i>Areca Catechu.</i>	..	Linseed	..	<i>Linum usitatissimum.</i>
Barley	..	<i>Hordeum vulgare.</i>	..	Lequats	..	<i>Eriobotrys Japonica.</i>
Bengalgram	..	<i>Cicer arietinum.</i>	..	Lucerne	..	<i>Medicago sativa.</i>
Bar	..	<i>Zizyphus Jujuba.</i>	..	Maize	..	<i>Zea Mays.</i>
Betelvins	..	<i>Piper Betle.</i>	..	Mango	..	<i>Mangifera indica.</i>
Blackgram	..	<i>Phaseolus Munge.</i>	..	Mangosteen	..	<i>Garcinia Mangostana.</i>
Brinjal	..	<i>Solanum Melongena.</i>	..	Mustard	..	<i>Brassica juncea.</i>
Cardamom	..	<i>Elettaria Cardamomum.</i>	..	Napier grass	..	<i>Pennisetum purpureum.</i>
Carrot	..	<i>Daucus Carota.</i>	..	Neem	..	<i>Azadirachta indica.</i>
Cashewnut	..	<i>Anacardium occidentale.</i>	..	Oats	..	<i>Avena Sativa.</i>
Castor	..	<i>Ricinus communis.</i>	..	Onions	..	<i>Allium Cepa.</i>
Chillies	..	<i>Capiscum sp.</i>	..	Oranges	..	<i>Citrus sp.</i>
Cholam	..	<i>Sorghum sp.</i>	..	Paddy	..	<i>Oryza sativa.</i>
Cloves	..	<i>Eugenia Coryophyllata.</i>	..	Panivaragu	..	<i>Panicum miliaceum.</i>
Cocconut	..	<i>Cocos nucifera.</i>	..	Palmyra	..	<i>Borassus flabellifer.</i>
Coffee	..	<i>Coffea arabica.</i>	..	Papaya	..	<i>Carica Papaya.</i>
Coriander	..	<i>Coriandrum sativum.</i>	..	Peach	..	<i>Prunus persica.</i>
Cotton	..	<i>Gossypium sp.</i>	..	Pears	..	<i>Pyrus communis.</i>
Cambodia cotton	..	<i>Gossypium hirsutum.</i>	..	Pepper	..	<i>Piper nigrum.</i>
Karunganni cotton	..	<i>Gossypium arboreum var neglectum forma indica.</i>	..	Philpesara	..	<i>Phaseolus trilobus.</i>
	..	<i>Gossypium arboreum var neglectum forma bengalensis.</i>	..	Pine apple	..	<i>Ananas sativus.</i>
Pulichai cotton	..	<i>Gossypium arboreum var neglectum forma mixture of Gossypium herbaceum and G. arboreum.</i>	..	Plantain	..	<i>Musa sapientum.</i>
Western cotton	..	<i>Gossypium arboreum, var typicum forma indica.</i>	..	Plums	..	<i>Prunus salicina.</i>
Northern cotton	..	<i>Gossypium arboreum, var typicum forma indica.</i>	..	Pomegranate	..	<i>Punica Granatum.</i>
Rosum cotton	..	<i>Gossypium arboreum, var typicum forma indica.</i>	..	Potato	..	<i>Solanum tuberosum.</i>
Nadam cotton	..	<i>Gossypium arboreum, var typicum forma indica.</i>	..	Pungam	..	<i>Pongamia glabra.</i>
Cowpea	..	<i>Vigna unguiculata.</i>	..	Radish	..	<i>Raphanus sativus.</i>
Cumba	..	<i>Pennisetum typhoides.</i>	..	Ragi	..	<i>Eleusine coracana.</i>
Dhaincha	..	<i>Securita aculeata.</i>	..	Redgram	..	<i>Cajanus Caskin.</i>
Durian	..	<i>Durio Zibethicus.</i>	..	Rubber plant	..	<i>Cryptostegia grandiflora.</i>
	..		..	Safflower	..	<i>Carthamus tinctorius.</i>
Field beans	..		..	Samai	..	<i>Pennisetum miliace.</i>
Fig	..	<i>Dalichos Lab Lab.</i>	..	Sapota	..	<i>Achras Saptote.</i>
Garlio	..	<i>Ficus Carica.</i>	..	Soya beans	..	<i>Glycine mzz.</i>
Gingelly	..	<i>Alium sativum.</i>	..	Straw berries	..	<i>Fragaria cernu.</i>
Ginger	..	<i>Sesamum orientale.</i>	..	Sugarcane	..	<i>Saccharum officinarum.</i>
Gogu	..	<i>Zingiber officinale.</i>	..	Sunhemp	..	<i>Crotalaria juncea.</i>
Grape fruit	..	<i>Hibiscus cannabinus.</i>	..	Tamarind	..	<i>Tamarindus indica.</i>
Greengram	..	<i>Citrus paradisi.</i>	..	Tapioca	..	<i>Manihot utilisima.</i>
Groundnut	..	<i>Phaseolus aureus.</i>	..	Tenai	..	<i>Scleria italica.</i>
Guava	..	<i>Arachis hypogaea.</i>	..	Teosinte	..	<i>Euchlonea mexicana.</i>
Guineagrass	..	<i>Pennisetum maximum.</i>	..	Tree tomato	..	<i>Cyrtomandra betacea.</i>
Horsegram	..	<i>Dalichos biflorus.</i>	..	Tobacco	..	<i>Nicotiana Tabacum.</i>
Indigo	..	<i>Indigofera sumatrana.</i>	..	Travellers' Tree	..	<i>Ravensala madagascarensis.</i>
Jak	..	<i>Artocarpus integrifolia.</i>	..	Tungoli plant	..	<i>Alcuritia ferdii.</i>
Kikuy grass	..	<i>Pennisetum clandestinum.</i>	..	Turneric	..	<i>Curcuma Longa</i>
Kolniji	..	<i>Tephrosia purpurea.</i>	..	Varagu	..	<i>Papalum scrobiculatum.</i>
Killagangeru	..	<i>Ipomoea hiepla.</i>	..	Variga	..	<i>Panicum miliaceum.</i>
Kolukkattai grass	..	<i>Gonchus cilariis.</i>	..	Wheat	..	<i>Triticum sp.</i>
Korra	..	<i>Scleria italica.</i>	..	Water hyacinth	..	<i>Eichornia crassipes.</i>
	..		..	Wild Indigo	..	<i>Tephrosia purpurea.</i>



FOOD AND AGRICULTURE DEPARTMENT

G. O. Ms. No. 912, 12th March 1963.

Administration Report—Department of Agriculture—1960-61—
Recorded with remarks.

READ—the following paper:—

* Letter from the Director of Agriculture, dated 14th March 1962,
Lr. No. G-3 Pdl. 86/61.

Order—No. 912, Food and Agriculture, dated 12th March 1963.

The report on the working of the Department of Agriculture for the year 1960-61 submitted by the Director of Agriculture is recorded with the following remarks:—

2. *Audit.*—It is seen that only 232 offices have been audited out of 1,021 offices and institutions of the department. The work in this regard continues to be unsatisfactory. Government consider that the organisational set up for internal audit of the accounts of the department should be thoroughly reviewed and it should be ensured that the accounts of all offices and institutions of a year are audited by the end of the succeeding year.

3. *Crop improvement.*—It is observed that despite intensive efforts of the department, the average yield per acre has not increased considerably during the year due to adverse seasonal conditions.

4. *Agricultural marketing.*—Although the tempo of activities of this section got accelerated during the year under review, Government consider that the section should gear its efforts to enable the ryots to get a fair return for his produce by organising grading of commodities at the stage of cultivator, by opening additional regulated markets and by working in close co-operation with the department of co-operation. It is also considered that there should be no duplication of work in regard to collection of data on prices and that appraisal of market intelligence should be left to the department of Statistics. The Marketing Section of the Department can instead usefully engage itself in collecting data regarding cost of production of agricultural commodities and working out cost of production schedules for various crops and tracts of the State.

2 NO. 912, FOOD AND AGRICULTURE, 12TH MARCH 1963

5. *Conclusion.*—The report shows that the working of the Department of Agriculture during the year under report has been generally satisfactory.

(By order of the Governor of Madras)

A. V. SANKARAN MANNAR,
Deputy Secretary to Government.

To the Director of Agriculture, Madras-5.

Copy to the Board of Revenue (Land Revenue), Madras-5.

„ the Board of Revenue (Civil Supplies), Madras-5.

„ the Board of Revenue (Food Production), Madras 5.

„ the Chief Engineer (Irrigation), Madras-5.

„ the Director of Statistics, Madras-7.

Revenue/I.L.C./Public Works/and Finance Departments.

„ the Director of Information and Publicity, Madras-9.

„ the Controller of Stationery and Printing, Madras-1.

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