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ADMINISTRATION REPORT
AGRICULTURAL DEPARTMENT
1952-53



2 JULY 1952
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AGRICULTURE DEPARTMENT

G.O. No 352, 8th February 1954

Administration Report—Agricultural Department—1952-53—
Recorded with remarks.

READ—the following paper :—

From the Director of Agriculture, dated 28th October 1953,
No. E-2-Pdl. 88/53.

Order—No. 352, Agriculture, dated 8th February 1954.

The report on the working of the Agricultural Department for the fasli year 1952-53 submitted by the Director of Agriculture is recorded with the following remarks.

2. *Seasonal conditions.*—The south-west monsoon was disappointing and below normal in all districts of the State except in Coimbatore. Cultivation operations in several districts were held up and foreboded another year of famine conditions. The setting in of the north-east monsoon was delayed. Fairly widespread rains were caused by the north-east monsoon in the Southern districts, the Circars and along the West Coast. A severe cyclonic storm struck the South Coramandal Coast near Nagapattinam towards the end of November and caused widespread rain in the Central and Southern districts with locally heavy rain and gales over the South Coramandal Coast causing considerable damage to crops in Tanjore and Tiruchirappalli districts. The rainfall was much below normal in Chingleput, South Arcot, Coimbatore, Tanjore, Madurai, Ramanathapuram and Tirunelveli districts and rainfed crops were affected in general. Thunder showers occurred in parts of the Central, Southern and West Coast districts and light showers in the Circars and Deccan during the hot weather period. A comparative statement showing the actual rainfall during 1952-53 as against the normal rainfall in all districts is appended to this year's report as a new feature. On the whole, the seasonal conditions for the year 1952-53 may be said to have been unfavourable for agricultural production in the State for the sixth year in succession.

3. *Food production drive.*—The second-year programme in the Five Year Plan of the State was executed during the year under review. It set an over-all target of increased production of 8.6 lakhs

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tons of rice and millets in the State by the end of 1955-56. The second year of the Plan aimed at a target of 452,858 tons of additional foodgrains through agricultural schemes. Most of the schemes under the Plan are continuations of those under the three-year Grow More Food Plan, but intensified for attaining self-sufficiency by the end of 1956. An additional quantity of 244,123 tons of foodgrains is estimated to have been produced during the year as a result of the operation of all schemes which directly contributed to increased production. Under the scheme of mechanised cultivation, an area of 52,291 acres was brought under cultivation by utilizing 302 tractors (165 with bull-dozer attachment) as against 51,983 acres brought under cultivation with the aid of 293 tractors (154 with bull-dozer attachment) during the previous year. The additional production estimated on account of reclaiming lands by tractors was 6,294 tons of foodgrains as against 5,487 tons of foodgrains during the previous year. Under the hire-purchase system, 775 oil engine pumpsets and 365 electric motor pumpsets were supplied to ryots during the year as against 1,201 oil engines and 191 electric motors during the previous year. The measures taken for the control of pests and diseases of crops has resulted in the saving of 786,959 acres of foodcrops and 991,393 fruit trees and plants from damage or destruction. It is estimated that 47,004 tons of foodgrains would have been thus saved. Manures, as detailed below, were distributed during the year under review as compared with the year 1951-52 under the scheme of distribution of manures:—

Name of manure.	Quantity distributed in 1951-52.	Target for 1952-53.	Quantity distributed in 1952-53.
	TONS.	TONS.	TONS.
Ammonium sulphate	80,401	1,56,000	85,511
Super phosphate	14,028	29,000	7,823
Urban compost	165,527	..	211,413

Under the second distribution scheme, the figures for the year 1950-51, 1951-52 and 1952-53 were as follows:—

	1950-51.		1951-52.		1952-53.	
	Target.	Quantity distributed.	Target.	Quantity distributed.	Target.	Quantity distributed.
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
Paddy ..	12,867	8,211	14,724	11,211	15,160	11,139
Millets ..	823	301	1,904	686	2,325	252
Pulses ..	31	1	104	64	77	18

The achievements continue to be far below the targets fixed and disappointing. The Director of Agriculture is requested to see that at least in future years the targets fixed are invariably reached.

4. *Cotton extension plan.*—The cotton extension scheme continued to be in force during the year as part of an All-India plan for increasing the production of cotton. Under the Plan, an additional area of about 71,854 acres is estimated to have been covered and the yield is estimated at about 35,019 bales of cotton as against the target of 99,483 acres and 75,011 bales of cotton. The achievements fell short of the targets owing to the adverse seasonal conditions. During the year, the Madras Cotton Control Act, 1932, was repealed and the Madras

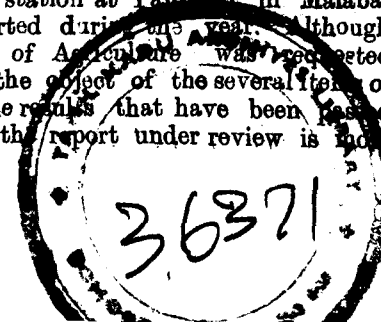
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Cotton Control Act, 1952, was enacted in its place. The purpose of the new Act is to facilitate the raising of improved strains in a pure condition in specified areas. The draft rules under the Act have been published for public information and criticism and they will be finalised shortly and further action taken to implement the provisions of the Act and Rules.

The Director of Agriculture is requested to append to his future reports a statement showing the targets fixed under the various items of the Cotton Extension Plan such as reclamation of fallow lands for raising cotton, diversion of certain lands under food and other crops to cotton, double and inter-cropping of cotton with commercial crops, application of fertilizers and distribution of improved seeds, and the achievements during the year under each one of them as compared with those of the previous year.

5. *Agricultural education.*—The number of admissions to each of the Agricultural Colleges at Coimbatore and Bapatla continued to be 96. One hundred and twelve graduates passed out of both the colleges during the year. The post-Graduate Diploma course in Horticulture which was run by the Agricultural Department has been affiliated to the University of Madras. The revised regulations for the B Sc. (Ag.) Degree Course providing for a course of intensive practical training in Agriculture for a period of six months at one of the Agricultural Research Stations or an approved farm have been finalised and approved for bringing into effect from the academic year 1953-54. The training will be given to the students at the end of the second year of the degree course during the period from July to December. The Agricultural College and Research Institute, Coimbatore, was selected by the Food and Agriculture Organization as the venue for the International Soil Fertility Training Centre. The training session was conducted for a period of three months from 15th July 1952. Eight trainees from foreign countries and eleven nominees of Indian State Governments took part in the training. The Principal of the College (Sri P. D. Karunakar) was appointed by the Food and Agriculture Organization as the Director of the Course. His conduct of the course was appreciated by the Food and Agriculture Organization.

6. *Agricultural research.*—The work in the several research sections continued to be satisfactory. Some new items of work were taken up during the year. Analysis of oil and water samples from the bore wells ayacut in Vriddhachalam taluk of the South Arcot district showed the suitability of the waters for irrigation. Pre-harvest and post-harvest soil samples from the Tanjore delta revealed that the nutrient status of the soils did not suffer as a result of growing cotton in paddy fallows. A farm was opened at Satyamangalam to analyse samples of soils and waters to study the influence of irrigation on these soils. A new research station at Vittal in South Kanara district for the investigation of stem-breaking disease of areca was opened during the year. Another research station at Pannipur in Malabar district for pepper research was started during the year. Although in the last review the Director of Agriculture was requested to give more clear statement of the object of the several items of research, the progress achieved and the results that have been passed on to the Agriculturists for adoption, the report under review is not



or less on the same lines as that for the previous year. The Director of Agriculture is requested to see that at least in the reports for future years the progress in the several branches of research is indicated in a manner intelligible to layman. He should furnish information regarding the actual progress made during the year, the economic gain to the ryots and to the State by adoption of the results of research, such as percentage of increase in yield per acre, area benefited, total additional production and its monetary value, etc.

7. *Crop improvement.*—During the year under review, six improved strains of paddy varieties grown in the State were released. The report does not mention the total quantity of improved strains of seeds distributed during the year. These improved strains are reported to cover 6.4 million acres which represent 60 per cent of the area under paddy cultivation. During the year 1950-51 itself, improved strains were reported to have covered 60 per cent of the area under paddy cultivation. Thus there has been no further progress in this regard. Five improved strains of pulses were released during the year. There is nothing worth mentioning in the breeding work in respect of other crops. In respect of cultural improvement of paddy, the Japanese method of cultivation with suitable modifications was recommended and extensive propaganda conducted.

8. *Crop sampling.*—The year under review was the third year of the implementation of the Five-Year Co-ordinated Scheme of Crop Sampling Surveys in this State. Crop-cutting experiment for estimating the average yield per acre and the total outturn were continued during the year on four major food crops, viz., 1) paddy, (2) cholam, (3) cumbu and (4) ragi. Two thousand five hundred and seventy-four crop-cutting experiments in paddy were planned under the survey, of which 2,293 were finalised during the year as against 2,540 experiments planned and 2,361 experiments finalised during the previous year. The average yield of paddy per acre according to these experiments is estimated at 1,452 lb. of paddy as against 1,397 lb. last year. Based on this average yield, the total production of paddy in the State during the year is estimated as 6,475,000 tons as against 6,019,000 tons estimated in the final official forecast report. As regards millets, 6,788 experiments were planned but only 2,918 were completed satisfactorily during the year. The lack of adequate interest on the part of the Revenue subordinates is said to be still the cause for the loss of such a large number of experiments. The Board of Revenue is requested to look into the reasons for this repeated complaint and to issue stricter instructions.

9. *Agro-Industries.*—The Government Malt Factory at Coimbatore was closed on 31st February 1953 due to non-availability of cholam at economic prices and the absence of an easy market in competition with lower priced foreign products. Under apiculture 4,764 hives were maintained by the Department during the year as against 3,110 hives during 1951-52. The estimated income to the farmers from the maintenance of these hives is said to be Rs. 82,200. The total number of hives maintained by ryots and other members of the public is reported to be 4,783 and 51,205 lb. of honey were extracted from them. The work on fruit products did not make much headway as the pilot factory was not set up completely. The Ergot Scheme in

Ootacamund was continued. On the farm 34 acres were sown to rye and this yielded 479 lb. of ergot. Some ergot was also produced at the Agricultural Research Station, Nanjanad.

10. *Soil conservation.*—This was the first year in which contour bunding and other soil and moisture conservation measures were adopted with advantage for providing work for rural labour to alleviate the widespread distress reported from the Chittoor and Vayalpad taluks in the Chittoor district and the Dharapuram taluk in the Coimbatore district. The scheme in Chittoor district covered a total area of 7,500 acres at a cost of about Rs. 5.5 lakhs. The Government of India sanctioned a loan of Rs. 3,76,210 and a grant not exceeding Rs. 94,052 in respect of the Coimbatore Contour-bunding scheme. A pilot scheme for an initial area of 89 acres in the Ketty Valley was sanctioned during the year and taken up for execution as an item of land improvement under the Madras Land Improvement Act, 1949, to tackle the growing problem of soil erosion of a serious type in the Nilgiris district.

11. *Agricultural Engineering.*—During the year, six Agricultural Demonstrators were given training in Agricultural Engineering for a period of one year and two Engineering Supervisors underwent training at the Central Tractor Organization, New Delhi, for a period of six months. Training courses in three batches for tractor and oil engine drivers were sanctioned during the year. A tractor workshop at Bellary was set up to cater to the needs of the Rayalaseema districts. The scheme for supply of oil engines and electric motors under hire-purchase system from the Central Agricultural Engineering Stores and Supply Centre was in operation during the year. Under the scheme 117 electric motors and 106 oil engines were purchased and supplied to ryots during the year. Almost all the 767 departmental oil engine pumpsets were on hire during the year for emergency lift irrigation. It is reported that this State leads the country in the matter of utilisation of power pumping units for agricultural purposes. The grant of loans not exceeding Rs. 2,500 for the purchase of pumping machinery to each ryot for the filter points sunk successfully in his lands contributed to the success of the filter point tube wells scheme. During the year 725 filter point tube wells were sunk as against a target of 600 wells. The work was done with great speed—thanks to the special interest taken by the Director of Agriculture. A pilot scheme for mechanised reclamation and terracing with tractor units over a compact block of 6,000 acres in Kampli area in the Bellary district which lies in the localised area of over 19,000 acres of land round about Kampli ayacut in the Tungabhadra Project zone was approved during the year. Refresher classes in tractor maintenance and operation were held during the year for District Agricultural Officers and they were given training in maintenance of tractors and other equipments. They were also given training in operating a tractor and bull dozer. It is disappointing to note that the 302 tractors of the Department were able to bring under cultivation only 52,291 acres during the year under report. During 1950-51, 66,720 acres were reclaimed with the aid of only 268 tractors. This shows that adequate attention is not being paid to the maximum utilisation of the available tractors to the best advantage.

12. *Propaganda, Publicity and Extension work.*—During the year 8,350 demonstration and trial plots were laid out in ryots' holdings as against 6,644 during the previous year. Though there is thus some

increase when compared with the previous year, the number of demonstration plots is still very inadequate as pointed out in last year's review. As indicated therein, the target should be at least one demonstration plot for each village. The Director of Agriculture is requested to see that this target is realised within the next two years.

During the year 23,201 Agricultural Associations were organized and 22,593 meetings of these Associations were held. There was a substantial response to the crop competitions conducted during the year in respect of paddy and sugarcane crops. It is disappointing to see a marked fall in the total number of subscribers for the Grow More Food Journals published in the four regional languages. Sixty thousand five hundred and forty-four copies of the journals were circulated towards the close of the year as against 106,819 copies during the previous year. The increase effected in the rate of annual subscription might have contributed to this fall. But as the size and get up of the journals have been improved correspondingly with the increase in the rate of subscription, it is hoped that the popularity of these journals will increase in the coming years. Three lakhs forty-one thousand six hundred and twenty-three copies of leaflets, pamphlets and other publications on different subjects were distributed by the Department during the year. Thirty-five radio talks on several agricultural subjects were given in the Rural Broadcasting service for the benefit of farmers and the rural people. The Department took part in 247 exhibitions held during the year.

13. *Community Projects and Rural Welfare Schemes.*—Out of 59 Community Projects for all India, the Government of India allotted six for this State. Each Project comprises roughly of about 300 villages with an approximate total area of 150,000 acres and a population of 200,000. Each project area is divided into three development blocks each consisting of about 100 villages. The following were the projects in this State:—

- (1) Kurnool-Cuddapah area.
- (2) East Godavari district (Ramachandrapuram taluk and parts of Kakinada, Peddapuram and Pithapuram taluks).
- (3) Lower Bhavani Project area.
- (4) Periyar area in Madurai district.
- (5) Malampuzha Project area in Malabar district.
- (6) Mangalore and Kasargod taluks in South Kanara district.

The main object of the Community Projects is to serve the fullest development of material and human resources of the area. The Agricultural Department's role in this programme is important. The Department drew up programmes of agricultural development for each of these projects, for execution of the Project Executive Officers. Training Centres were also opened at Kakinada, Palghat and Dindigul for the training of Village Level Workers for the projects.

The Department also helped in the working of the Rural Welfare Scheme in 83 firkas under the Director of Rural Welfare. The services of 84 fieldmen and 168 Demonstration Maistries were lent for the scheme. During the year the scheme was extended to 25 additional firkas. The concessional sale of agricultural implement, manures, etc., in the selected firkas were effected through special depots besides village co-operatives.

14. *Agricultural marketing.*—It is reported that no fresh marketing survey was conducted during the year. A new grading station for ghee was opened at Coimbatore during the year. North Arcot district was notified as a regulated market under the Madras Commercial Crops Market Act for groundnuts. The sphere of work of the Coimbatore and South Arcot Market Committees was enlarged by adding tobacco as a notified crop for the Coimbatore district and cotton and gingelly as notified crops for the South Arcot district. The validity of the Madras Commercial Crops Market Act, 1933, was challenged through several writ petitions in the Madras High Court. The High Court has held that section 5 (4) (a) of the Act is void to the extent that it confers on the Collector power to refuse a licence at his own discretion, that Rule 37 of the Madras Commercial Crops Market Rules is void in so far as it prohibits persons whose names have not yet been registered as buyers and sellers for carrying on business, in the notified area and that subject to this the Act and Rules must be upheld under Article 19 (6) of the Constitution as a valid piece of marketing legislation. The Government are taking necessary further action in the light of the High Court Judgment. Misconceptions about the scope and purpose of the Act continue to exist in the minds of traders. The Department should educate the public and remove misconceptions.

15. *Finance.*—The expenditure on Agriculture under "40. Agriculture" during the year was Rs. 261.76 lakhs as against Rs. 316.49 lakhs during the previous year. The overall decrease of Rs. 54.73 lakhs in expenditure during the year is mainly due to the postponement of purchase of machinery, equipments and tractors, non-purchase of seeds under Seed Development Scheme as per programme, savings under crop and plant protection work and general economy and small savings under other items. The receipts under "XXIX. Agriculture" increased from Rs. 110.95 lakhs during last year to Rs. 135.28 lakhs during the year under review. The increase in revenue is due to general increase in the revenue of research stations and recovery of overpayments and general increase under other items in view of the all-round expansion of the departmental activities. During the year a sum of Rs. 30.33 lakhs was disbursed as loans for purchase of seeds and manures and Rs. 0.27 lakh for purchase of agricultural implements as against the sum of Rs. 31.51 lakhs for seeds and manures and Rs. 0.19 lakh for agricultural implements during 1951-52. Besides, under the intensive manuring scheme a sum of Rs. 77.97 lakhs was granted as loans to ryots in the year under review as against Rs. 71.03 lakhs granted in the previous year. The loans totalling Rs. 30.33 lakhs for purchase of seeds and manures referred to above were interest free.

16. *Administration and supervision.*—The irregularities in regard to the purchase, maintenance and disposal of stores in certain sections of the Agricultural College and Research Institute at Coimbatore and the many instances involving deficits of stocks stored at the various Agricultural Depots that are being reported to the Government reveal that there is need for stricter check and supervision of work of the subordinate officers by the superior officers of the department. The Director is requested to tighten up supervision and ensure that such defects do not occur in future.

17. *Preparation of the report.*—Statistics should be given wherever necessary in future reports, e.g., the number of Propaganda meetings held, the number of non-gazetted staff in the Department, the number of applications for admissions received in Agricultural Colleges, the quantity of green manure seeds and improved strains of paddy seeds distributed, the varieties of seeds and the quantities multiplied in the seed multiplication schemes and the number of oil engines and electric motors hired to ryots during the year. Some of the above particulars have since been obtained from the Director of Agriculture and appended to the present report. The Director of Agriculture is requested to see that such important particulars are not omitted in his future reports.

18. *Conclusion.*—With the launching of the programme of National Extension Service in this State in October 1953, the Department of Agriculture has to assume greater responsibilities than ever before because of agricultural development is the dominant activity in its programme. Consequent on Andhra separation the need to increase production has become imperative. The Department has now a smaller area to concentrate its attention and it should be possible to do intensive work and produce good results with the favourable seasonal conditions this year. All round attention should be paid to all aspects of work instead of one-sided attention to a few items only. The Government trust that the Department will play an effective part in the fulfilment of the State Development Plan.

(By order of the Governor)

R. A. GOPALASWAMI,
Secretary to Government.

To the Director of Agriculture, Madras.

„ Director of Industries and Commerce, Madras.

„ Registrar of Co-operative Societies, Madras.

Copy to the Inspector of Municipal Councils and Local Boards, Madras.

„ the Chief Engineer (Irrigation), Madras.

„ the Board of Revenue (Land Revenue), Madras.

„ the Board of Revenue (Civil Supplies), Madras.

„ the Agriculture (Food Production) Department, Madras.

„ the Director of Statistics, Madras.

„ the Public Works, Revenue and Industries, Labour and

Co-operation Departments.

„ the Government of India, Ministry of Food and Agriculture, New Delhi.

„ the Director of Information and Publicity, Madras.

„ the Controller of Stationery and Printing, Madras.

„ BI, BIII, and BIV Sections.

„ the Secretary to Government, Revenue Department, Government of Andhra, Kurnool.

„ the Secretary to Government, Home, Forest and Agriculture Department, Government of Mysore, Bangalore.

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ADMINISTRATION REPORT OF THE AGRICULTURAL DEPARTMENT FOR THE FASLI YEAR 1952-53

I. ADMINISTRATION.

1. (1) Sri M. S. Sivaraman, I.C.S., continued as Director of Agriculture throughout the year under report. Sri B. M. Lakshmipathy, Joint Director of Agriculture (Engineering) and Sri Kanti Raj, Joint Director of Agriculture (Extension), also continued in the respective posts.

(2) Dr. K. C. Naik continued as Headquarters Deputy Director of Agriculture (Research) and Sri V. K. Subramania Mudaliar continued as Headquarters Deputy Director of Agriculture (Inspection) up to 10th January 1953, when he retired from service. Sri S. N. Venkataramana Iyer assumed charge as Headquarters Deputy Director of Agriculture and continued till the end of the year under report.

(3) Sri V. Venkatarayudu was Personal Assistant up to 3rd March 1953. Sri E. S. Nagesan took charge as Personal Assistant on 4th March 1953 and continued.

The following posts were made permanent during the year :—

(1) Superintendent, Agricultural Research Station, Tirurkuppam, from 1st March 1953.

(2) Agricultural Meteorologist, Coimbatore, from 1st April 1953.

(3) Superintendent, Agricultural Research Station, Samalkot, from 9th October 1952.

Consequently the cadre strength in the Madras Agricultural Service increased from 104 to 107 as on 30th June 1953.

2. The following officers were on other duty under other departments :—

(1) Sri K. Rama Rao, District Agricultural Officer, as Special District Agricultural Officer, Tungabhadra Project, Bellary, from 1st December 1950.

(2) Sri C. Annamalai, District Agricultural Officer, as Special Officer for Propaganda (Food Production), Madras, from 1st December 1951 to 17th August 1952 and as Assistant Marketing Officer (Civil Supplies), Hyderabad, from 26th November 1952 to 24th April 1953 and as Movement Officer (Civil Supplies), Visakhapatnam, from 30th April 1953 to 29th July 1953.

(3) Sri D. Viswanatha Reddi, Deputy Director of Agriculture, as Compost Development Officer under the Indian Local Board, Madras, from 23rd September 1950.

(4) Sri K. R. Nagarajan, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), from 17th October 1952.

(5) Sri M. S. Kylasam, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), from 29th January 1945.

(6) Sri C. Krishnamurthy, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), from 20th December 1950.

(7) Sri P. R. Nagaraja Rao, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), from 16th October 1952 to 30th September 1953.

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

(1) Sri K. Bramachari, Assistant Entomologist, as Assistant Director (Storage), Madras, from 17th October 1952.

(2) Sri P. S. Krishnamurthi, Assistant Entomologist, as Assistant Director (Storage), Madras, from 16th October 1952.

(3) Sri V. Marghabhandu, Assistant Entomologist, as Assistant Director (Storage), Madras, from 6th August 1946.

(4) Dr. G. S. Siddappa, Bio-chemist, as Senior Scientific Officer, Government Food Technological Institute, Mysore, from 8th December 1950.

The following Officers were on foreign service :—

(1) Sri S. Sundaram, Assistant Cotton Specialist, as Agronomist under the Indian Coffee Board, from 1st January 1947 to 30th November 1952.

(2) Sri I. Kurma Rao, District Agricultural Officer, under K. C. P., Ltd., Vuyyuru, as Special Officer, from 22nd January 1946 to 30th June 1953.

(3) Sri K. Kunhi Kannan Nambiar, Superintendent, Agricultural Research Station, as Secretary, Indian Council Arecanut Committee, from 25th October 1949.

(4) Sri D. Achyutharamaraju, District Agricultural Officer, Secretary, East Godavari Market Committee, from 24th February 1951.

(5) Sri M. P. Narasimha Rao, Superintendent, Agricultural Research Station, Secretary, Krishna District Market Committee, from 30th August 1951 to 13th October 1952.

(6) Sri C. M. John, Principal, Agricultural College, Coimbatore, as Director, Central Coconut Research Station, Kasaragod, from 1st February 1950 to 8th June 1953.

(7) Sri P. Seshadri Sarma, District Agricultural Officer, as Secretary, Bellary Market Committee, from 1st June 1951.

(8) Sri E. J. Varghese, Assistant Agricultural Chemist, as Analytical Chemist, Central Coconut Research Station, Kasaragod, from 21st August 1951.

(9) Dr. S. Krishnamurthy, Curator, Government Botanical Gardens, Ootacamund, as Professor of Agriculture, Annamalai University, from 26th July 1951.

(10) Sri C. P. Raju, Assistant Agricultural Engineer (Research), Coimbatore, as Agricultural Engineer under the Indian Central Sugarcane Committee, from 21st August 1951.

(11) Sri K. Sivasankara Menon, District Agricultural Officer, as Secretary, Malabar District Market Committee, from 4th May 1952.

(12) Sri S. Sampath, as Cyto-geneticist, under the Central Rice Research Institute, Cuttack, from 28th January 1953.

(13) Sri K. Tejappa Shetty, District Agricultural Officer, as Secretary, South Kanara Market Committee, from 1st June 1953.

(14) Sri K. Raghunatha Reddy, District Agricultural Officer, as Secretary, Vijayavada Market Committee, from 23rd October 1952.

New posts sanctioned.

1. Cane Development Officer, from 19th December 1952 (for one year).
2. Sugarcane Inspector, Visakhapatnam, from 23rd December 1952 (for one year).

3. Additional District Agricultural Officers (Manuring Scheme)—10 posts at Eluru, Kakinada, Vijayavada, Guntur, Nellore, Tanjore, Pattukkottai, Madurai, Tiruchirappalli and Tirunelveli up to 30th November 1952.

4. Assistant Agricultural Engineer (Pilot Scheme), Bellary, from 29th May 1953.

5. Assistant Agricultural Engineer (River-pumping Scheme), from the date of appointment to 31st March 1954.

6. Gazetted Assistant to the Cotton Certification Officer, Rajapalayam, from the date of appointment to 31st March 1954.

7. Three posts of District Agricultural Officers sanctioned for appointment as Principals and Vice-Principals of Community Project training centres at Parli, Gandhigram and Samalkot.

Posts abolished.

1. Assistant Agricultural Engineer (State Farming Scheme) from 31st December 1952.

2. Assistant Entomologist, Fernhill, from 1st August 1952.

3. Ten posts of Additional District Agricultural Officers sanctioned for Intensive Manuring Scheme.

II. INSPECTION.

1. *Audit and Inspection by the Internal audit party.*—During the fasli year 1952–53 the audit and inspection of the following offices and institutions were completed :—

Offices of Heads of sections	16
Agricultural Research Stations	27
Offices of District Agricultural Officers	17
District Agricultural Engineering Sections	13
Offices of the District Agricultural Officers (Crop sampling)	4
Office of the Deputy Directors of Agriculture	3
Agricultural Depots	140
Office of the Coconut Nursery Assistants	4
Seed Development Officers' offices	3
Office of the Assistant Marketing Officers	2
Tractor Workshops at Coimbatore and Bapatla	2
Agricultural College and Research Institute, Coimbatore	1
Agricultural College and Research Institute, Bapatla	1
Office of the Assistant Cotton Specialist under Indian Central Cotton Committee Scheme	8
Office of the Assistant Agricultural Engineer (Inspection) and Assistant Agricultural Engineer (Soil Conservation)	4
Offices of the Crop and Plant Protection Officers, Mycology and Entomology at Coimbatore and Bapatla	4
Other Heads of Offices	5
Total	254

General instructions on the proper upkeep and maintenance of stores records procedure of accounting were issued from time to time.

Inspection by Headquarters Deputy Director of Agriculture—(a) Research.—The Headquarters Deputy Director of Agriculture (Research) inspected a total of 34 Research Stations, Centres or Laboratories during the year under report as against 24 inspected in the preceding year. The former inspections covered ten Agricultural Research Stations, four Fruit Research Stations, four Model Orchards *cum* Nurseries, three Crop Breeding Stations, two Laboratories with attached field centres, two Cane Liaison Farms, three Coconut Nurseries, three Special Crop Research Stations as on Pepper, Areca and Cashew, one Cotton Scheme and the Soil Conservation work in Bellary and Guntakal areas. The work under way was fully examined against the background of the sanctioned Three-Year Programme of work as against the achievements previously recorded and detailed reports indicating the defects if any and the lines of work that are required to be pursued, were submitted to the Director of Agriculture. These reports were considered by the Director of Agriculture together with the remarks received thereon from the concerned Research Officers and detailed orders were issued with specific instructions.

(b) Inspection.—The Deputy Director of Agriculture, Headquarters (inspection) inspected four offices for district work and half-yearly reports were submitted to Government. The annual district work programme of the 27 districts was finalized for the year 1953–54.

Regional Deputy Directors of Agriculture.—The inspections done by the Regional Deputy Directors of Agriculture are shown below :—

Deputy Director of Agriculture.	Number of offices required to be inspected.	Number actually inspected.	Remarks.
Tanjore	6	6	Satisfactory.
Vellore	3	3	Do.
Madurai	6	6	Do.
Cuddapah	8	8	Do.
Coimbatore	10	10	Do.
Guntur	5	5	Do.
Eluru	24	31	Do.
Visakhapatnam	4	4	Do.

They inspected the offices of the District Agricultural Officers and Agricultural Demonstrators and checked up the district work. In general the work was satisfactory.

The subordinate officers have performed the required tours and inspections. The office procedure is improved in efficiency. In some cases there were inadequate night halts. The District Agricultural Officers have been instructed to make the requisite number of halts.

Heads of Research sections.—The heads of Research Sections inspected all the offices of the Subordinate officers except the Cotton Specialist, Oil-seeds Specialist and Paddy Specialist due to change of personnel and pressure of

work. The Paddy Specialist was on deputation to Japan. The inspections performed by them are indicated below :—

	Number of offices required to be inspected.	Number actually inspected.	Remarks.
Government Agricultural Chemist	3	3	
Government Entomologist ..	3	3	
Oilseeds Specialist	12	6	Heavy office work. Attended meetings of the Commodity Committee at Delhi and Ernakulam.
Cotton Specialist	5	2	
Government Mycologist	2	2	
Paddy Specialist	7	6	
Fruit Specialist	2	2	
Sugarcane Specialist	2	2	
Millet and Pulses Specialist ..	5	5	

They examined the work in progress and inspected the offices. Instructions were issued wherever necessary. There were no noteworthy discrepancies.

Tours and inspection have been adequate. Efficiency and discipline have been generally satisfactory. The Scheduled number of inspections of the Oilseeds Specialist will be carried out in the coming year.

III. A BRIEF REVIEW OF THE YEAR'S CONDITIONS.

Due to inadequate rains during the south-west monsoon, the delayed onset of the north-east monsoon and insufficient supply in irrigation sources, the year's output of crops was considerably affected. The cyclone in November caused damage to the paddy crop and coconut and banana plantations in Tanjore and the coastal areas of the neighbouring districts. The output of millets was generally poor due to deficient rainfall. The total production of rice and millets in 1952–53 is estimated at 6,081,000 tons i.e., 4,033,000 tons of rice and 2,048,000 tons of millets. The seed requirements according to the Five-Year Plan are 20,200 tons for rice and 50,000 tons for millets. The net quantity of rice and millets available for consumption was 5,828,500 tons. The slump which set in towards the close of the year 1951–52 in the markets improved gradually towards the end of 1952, and by the end of the year 1952–53, the general trend of the markets became firm. The foodgrains were decontrolled in June 1952. This was a long desired measure and the ryots welcomed it. Even after decontrol prices did not shoot up to any undesirable levels. Rice was freely available in the markets. The control over release of sugar from factories was maintained even after abolishing sale of sugar in the controlled market. Conditions of famine prevailed in the districts of Madurai, Ramanathapuram, Chittoor, Cuddapah, Anantapur and Kurnool. Famine relief measures adopted in time alleviated the sufferings of the people considerably. There was a general failure of rainfed crops in these districts and where harvests were made the outturn was poor. Cane jaggery prices increased during the year and sugarcane growers were considerably benefited. The cotton crop was small due to failure of rains. The prices began improving during the close of the year. The groundnut output was limited due to the wide-spread scanty rain-fall, and groundnut prices were generally on the high side except in November-December 1952.

IV. SPECIAL FEATURES OF THE YEAR.

This is the second year of the operation of the various schemes in the Five-Year Plan. All the schemes that were run in the last year of the three-year plan were continued during this year except a few minor schemes like Model farms, Honorary Propagandists and Rural Compost which were discontinued. The general procurement of food crop seeds was rendered a limited achievement on account of the decontrol. However, to keep the targets, improved seeds were procured at local market rates offering a premium of 10 per cent. The department endeavoured to keep up the targets. Details of targets and achievements are furnished in Appendix I. The various intensive cultivation schemes are discussed in the Chapter on these schemes.

The community Development Projects were continued in the six selected centres and the special staff started the work as per programme drawn up.

Filter-point Tube-well Scheme.—The filter-point tube-well scheme was continued on a larger scale during the year under report. The scheme was put into operation on an expanded scale for installation of 600 filter points in East Godavari, West Godavari, Guntur, Nellore, Chingleput, North Arcot, South Arcot, Tanjore, Tiruchirappalli, Madurai and Ramanathapuram. The work in progress during the year exceeded the target of 600 by 125. So far 583 loans were sanctioned to farmers for installation of pumping equipment for pumping water from these 725 successful filter points. These loans are recoverable only in instalments at $5\frac{1}{2}$ per cent interest. The grant of these loans was an incentive to the farmers to sink the desired number of filter-point tube-wells.

Another special feature of the year was the introduction of Japanese method of rice cultivation modified to suit the conditions in this State. The technique of "Japanese method of cultivation" adopted by the Kora Kendra of Bombay, suitably modified was launched on a large scale in villages all-over the State. The special features of this propaganda are selection of good seed, proper preparation of seed, thin sowing of nursery, adequate manuring of the seed bed, proper preparation of the main land, careful transplantation of the seedlings, intensive and timely manuring of the main field by making as much of manure available for plant growth and careful interculturing. So far as this State is concerned, most of the improved practices advocated in the Japanese method have long been advocated by the department as a result of the valuable researches conducted in improving rice yields on the Agricultural Research Stations of the Department. However, to give an impetus to food production in this State the Japanese method of rice cultivation was launched and an intensive campaign was put through. Sulphate of Ammonia and Super Phosphate were extensively used for manuring of paddy crops supplemented by green manure and organic manures. It is expected that 27 lakhs of acres would be intensively manured with Sulphate of Ammonia and the yield of paddy stepped up. Under the special grants made by the Indian Council of Agricultural Research, two experiments are under way one at Paddy Breeding Station, Coimbatore, and the other in eight selected centres in the districts to find out the specific benefits of the Japanese method of rice cultivation.

Training Course for young farmers was sanctioned during the year with a view to benefit them by providing all-round practical training in the subjects of Agriculture and Animal Husbandry, marketing, etc., in three centres, Coimbatore, Taliparamba and Bapatla under a grant of the Indian Council of Agricultural Research. The young farmers, during the training will

get acquainted with recent developments in Agricultural production. They are expected to utilize the knowledge gained for developing their own lands on fruitful lines. The course is expected to commence in early July 1953.

A special drive was also launched this year for greater income from the agricultural stations. It was impressed on the officers in charge of Agricultural Farms and Research Stations that they should reduce their expenditure as far as possible and increase the receipts so that farming becomes really a profitable operation. Without interfering with Research, satisfactory results have already been achieved on the Agricultural Research Stations at Aduthurai and Pattukottai. It is the intention of the Department that these Stations should serve as a real model of profitable farming to the ryots of this State and all endeavours are being done to establish this.

Agricultural associations.—Associations of farmers were organized to help in the rapid spread of agricultural improvements. Twenty-three thousand two hundred and one Agricultural Associations were organized during the year and 22,593 meetings were held. The requirements of farmers were ascertained through these Associations and arrangements made to distribute improved seeds and green manures through the members of selected Associations.

Sesbania speciosa—Green manure campaign.—Green manuring is essential in maintaining or raising crop producing capacity of the soil. *Sesbania speciosa* which was found as a quick growing green manure crop producing abundant foliage was successfully multiplied during the last year, and seed distributed extensively during this year under a special green manuring campaign. The Department has evolved cheap methods of growing it in lines in the paddy field along the margins occupying no extra cultivated land. It has many special advantages, namely:—

- (i) It is cheap, $\frac{1}{4}$ lb. seed covering 1 acre.
- (ii) No extra land is required as it is raised on the margin of paddy fields, yielding 2,000 to 3,000 lb. green leaf.
- (iii) It grows throughout the year with little attention.
- (iv) As a pure crop gives the largest yield of green leaf.
- (v) Seeds can be easily produced by the ryot who can become self-sufficient.

Forty-two tons of seed was distributed during the year covering an area of 94,080 acres for green manuring purposes. Besides 186,220 acres of mainly paddy land were sown with *Sesbania* in lines for seed purposes. One hundred and forty tons of seed was collected for further distribution.

Improved paddy seed distribution by ryots.—One of the most outstanding achievements of the Department is the release of improved strains of paddy seeds for the different districts, which is being done to cover an extent of about 6 lakhs acres every year. There is some natural spread for seed so distributed. But to rapidly extend the coverage by improved seed for all the area, the Department has to produce and handle about 57,900 tons of seed required for one fourth the paddy area of the State every year. This will require extra staff and difficulties of handling like storage, etc. An ideal approach to the problem is to make every ryot raise his own requirements of improved seed and for this purpose he should be supplied improved seed of guaranteed purity once in four years. Sufficient quantity of primary seed is supplied to farmers to raise their requirements of seed. The ryot saves extra charges and Government saves expenditure. It eliminates the second stage of seed multiplication. This scheme was tried on an experimental scale in a few selected villages of some

districts along-side the existing system of multiplying seed in two stages and distributing through agricultural depots. Fifty tons of improved paddy seed were so distributed during the year. The ryots are thus helped to be self-sufficient for pure seed. Each ryot is given up to 10 lb. of seed at 1 lb. per acre. This scheme is being expanded in all paddy growing districts in the current season, so that more areas can be covered.

1 *Rainfall conditions during kharif and rabi seasons separately.*—In this State the following seasons are of importance:

(a) South-west monsoon (June to September).

(b) North-east monsoon (October to January).

(c) Hot weather period (February to May).

South-west monsoon (June to September 1952).—The south-west monsoon set in the west coast on 6th June 1952. Its further advance in the country was however slow and it was generally feeble during June to September 1952 except for a temporary revival between the 20th and 24th August during which period widespread rains occurred in the circars and Ceded districts. Rainfall during the south-west monsoon period was below 'normal' in all districts of the State except Coimbatore. Cultivation operations in several districts were held up and foreboded another year of famine conditions. Paddy crop in high level lands in the west coast suffered and in the upland areas of the Circars.

North-east monsoon (October 1952 to January 1953).—Temporary north-east monsoon conditions set in between the 3rd and 6th October thus causing fairly widespread rains in the southern districts, circars and along the west coast. There was more further widespread rainfall between the 15th and 17th October in the Circars and thereafter the weather was generally dry, except in the west coast, up to the end of November 1952. The setting in of the main monsoon rains was generally delayed. A severe cyclonic storm developed in the South Bay of Bengal towards the end of the month striking the South Coromandal Coast near Nagapattinam (Tanjore district) on the 30th November, causing widespread rain in the central and southern districts with locally heavy rain and gales over the South Coromandal Coast and the Tanjore and Tiruchirappalli districts. Between the 6th and 8th December 1952 under the influence of a shallow depression in the Bay, widespread rainfall occurred in the Central and Southern districts and moderate showers in the Circars and Deccan districts. During the north-east monsoon period (October 1952 to January 1953) the rainfall was above normal in the districts of Srikakulam, Visakhapatnam, Kakinada, Bellary, Chittoor, North Arcot, Salem and South Kanara and below 'normal' in all the other districts of the State much below 'normal' in Chingleput (-30.9 per cent), South Arcot (-29.4 per cent), Coimbatore (-36.4 per cent), Tanjore (-34.3 per cent), Madurai (-46.1 per cent), Ramanathapuram (-47.9 per cent) and Tirunelveli (-56.2 per cent).

Many wells dried up in Coimbatore district. In December conditions improved slightly except in the south where the rainfall was below normal. Rainfed crops were affected in general.

Hot weather period (From February 1953 up to end of April 1953).—The weather was mainly dry in February 1953, March 1953 and during April 1953 thunder showers occurred in parts of the Central and southern and the west coast districts and light showers in the circars and Deccan. During the period the rainfall was normal in Bellary and in Tirunelveli districts, below 'normal' in the Circars and the Coimbatore districts and in South Kanara and above 'normal' in the remaining districts. Garden

land cultivation was pushed through and preparatory cultivation of dry lands was taken up. Summer rain-fed crops like groundnut, cholam and cumbu were benefited.

2. *Conditions of kharif and rabi crops.*—The yield per acre of cereals in 1952-53 was below 'normal' in all the districts of the State due to inadequate rains during the south-west monsoon, delayed onset of the north-east monsoon and inadequate water-supply in the irrigation sources. The November end cyclone caused damage to paddy crops in an area of about 51,000 acres in Tanjore district, about 28,000 acres in the coastal areas of the district by the inundation of sea water and about 23,000 acres in the other parts of the district. The yield in the cyclone ravaged area of 51,000 acres was estimated at 30 to 40 per cent of the normal. An area of 3,000 acres of dry crops was also affected by the cyclone in the Tanjore district.

Paddy crop has been deeply affected in the following districts (1952-53):—

Districts.	Paddy (Seasonal factors).		
	First crop.	Second crop.	Third crop.
(1)	(2)	(3)	(4)
Ramanathapuram	56	50	50
Chingleput	62	65	60
Chittoor	62	..	70
South Arcot	64	70	65
North Arcot	65	..	70
Madurai	65	60	60
Tirunelveli	..	65	60
Tiruchirappalli	..	..	70

The next important food crop in this State is Cholam. The seasonal factor adopted for this crop in the final forecast report 1952-53 may be assumed to reflect generally the conditions of millet crops in this State. The millet crops have been adversely affected in the following districts as will be seen from the seasonal factor adopted for Cholam 'Kharif and Rabi crops':—

Districts.	Cholam (Seasonal factor).	
	Kharif crop.	Rabi crop.
(1)	(2)	(3)
Cuddapah	60	60
Anantapur	65	65
North Arcot	65	62
Ramanathapuram	67	65
Bellary	70	70
Tirunelveli	70	65
Madurai	..	70

V. AGRICULTURAL EDUCATION.

1. *Agricultural Colleges*.—The number of students in each of the three classes at the end of the year 1952-53 were as follows:—

(1)	Agricultural College, Bapatla.	Agricultural College, Coimbatore.
First year B.Sc. (Ag.)	96	90 + 6 (re-admitted).
Second year B.Sc. (Ag.)	73	67
Third year B.Sc. (Ag.)	62	48

The short courses in Agriculture and allied subjects could not be run during the year due to increased admissions to B.Sc. (Ag.) and want of accommodation.

Students' tour.—The students of the Bapatla College were taken on educational tours during the year. The first year students visited Guntur Lam, Narasaraopet and Chirala; the second year students Hospet, Madras, Nandyal, Hagari, Siruguppa, Kodur and Samalkot; the final year students on tour visited Madras, Hosur, Bangalore, Hebbal, Hassaraghatta, Coonoor, Ootacamnd, Burliar, Kallar, Coimbatore, Tiruppur and Katpadi. The second year students of the Coimbatore College visited Nilgiris, Kodur, Bapatla, Guntur, Nandyal, Hagari and Hospet and the final year students visited Bangalore, Hosur, Cuddalore and Aduthurai.

Scholarships.—The following scholarships were awarded to the students at the Colleges:—

(1)	Coimbatore.	Bapatla.		
	First year.	First year.	Second year.	Third year.
(1)	(2)	(3)	(4)	(5)
Backward classes	5	5	4	5
Muslim	1	1	1	1
Merit	2	..	..	2
Harijan Welfare Department Scholarship (Madras State).	4	..	6	5
Harijan Welfare Department Scholarship (Madras State), renewals, second and third years.	10	..	..	..
Government of India scholarship for students from Scheduled Castes and Tribes.	2	2	..	2

Examinations.—The number of students that appeared for the examinations, the number passed and percentage of passes are as follows:—

Agricultural College, Coimbatore.

Year.	Number appeared.	Number passed.	Percentage of pass.
I Examination	94	84	89
II Do.	78	69	88
III Do.	56	40	..

Agricultural College, Bapatla.

Year.	Number appeared.	Number passed.	Percentage of pass.
I Examination	92	73	79
II Do.	86	62	72
III Do.	82	64	78

College hostels.—The general health of the students residing in the hostels was satisfactory throughout the year. Vegetarian and non-vegetarian sections were run as usual.

Students' clubs.—The literary and sports activities of the students were continued as in previous years. The Bapatla College students took part in the Inter-Collegiate Tournaments of the Andhra University held at Kakinada.

International School of Soil Fertility Training.—The Agricultural College, Coimbatore, was selected as the suitable centre, for running the three months' 'Soil Fertility' Course as per recommendations of the International Rice Commission of the Food and Agricultural Organization from 15th July 1952. Eight trainees from foreign countries and eleven nominees of Indian State Governments took part in the training.

Visitors.—Besides the members of the Board of Honorary Visitors the following distinguished personages visited the Colleges during the year:—

Sri Sankara Reddy, Minister for Local Administration, Madras.
 Dr. M. V. Krishna Rao, Minister for Education, Madras.
 Dr. N. Naganna Gowd, Minister for Agriculture, Madras.
 Dr. P. N. Ganapathi, Professor of Botany, Waltair.
 The Vice-Chancellor, Andhra University, Waltair.
 The Collector of Guntur.
 Mr. Everett M. Woodman, U.S.I.S., Madras.
 Sri N. Kanungo, M.P.
 Mr. Robert L. Pendleton, F.A.O., Bangkok.
 Dr. H. G. Dion, F.A.O.
 Mr. Malik, Director of Veterinary Services, Bihar.
 Mr. T. B. Patridge, Agrostologist, Brisbane, Australia.
 Mr. R. G. I. Main, Parry & Co., Ltd., Madras.
 Dr. V. G. Panse, Statistical Adviser, Indian Council of Agricultural Research, New Delhi.
 Mr. V. N. Amble, Statistician, Indian Council of Agricultural Research, New Delhi.
 Dr. Moomav, F.A.O., Washington, United States of America.
 Sri Shri Prakasa, Governor of Madras,
 Sri R. M. Sundaram, I.C.S., Secretary to Government, Food and Agriculture Department, Madras.
 Sri V. C. Subbiah Gounder, President, District Agricultural Association.
 Sri G. R. Govindarajulu, Managing Director, Pioneer Mills.
 Sri G. D. Naidu, Coimbatore.
 Sri T. S. Sadasivam, Head of Department of Botany, Madras University.
 Dr. Singo Mitsui, Faculty of Agriculture, Tokyo University, Tokyo, Japan.

Dr. J. K. Basu, Director of Agriculture, Bombay State.

Sir. T. S. Venkatraman, retired Sugarcane Expert.

Dr. Patwardhan, Director of Food Nutrition Research Institute, Coonoor.

Dr. S. P. Ray Chaudri, Head of the Division of Chemistry, Indian, Agricultural Research Institute, New Delhi.

Sri M. B. Hussain, Professor of Agriculture, Osmania University, Hyderabad.

Dr. H. N. Mukerjee, Agricultural Chemist to the Government of Bihar Sabour, Bihar.

Miss Jean Lyon (Journalist) United States of America.

Mr. James W. Warner, Head of Department of Animal Husbandry and Dairying, Agricultural Institute, Allahabad.

Sri S. V. Govindarajan, B.Sc. (Hons.), Agricultural Chemist, Bangalore.

Dr. Cowjill and Dr. Wellman, Experts on Coffee.

Mr. S. K. Dey, Chief Honorary Administrator for Community Projects in India.

Sri. T. S. Ramachandran, I.C.S., Director, Community Project, Madras State.

Dr. Ahmed, Minister for Agriculture and Co-operation, Bengal.

Mr. U. Baji, Vice-Counsul, Burma, Madras.

Sri P. M. Joseph, Agricultural Special Officer, Alwaye.

Sri N. Paul V. Gupta, acting Principal, Hindustan Bible Institute.

Sri K. V. Narayana Reddy, B.Sc. (Ag.), Agricultural Officer, Savagram Rural University.

Sri T. Ramachandran, Defence Ministry, Resettlement.

Sri R. K. Kandaswamy Chettiar, Honorary Visitor, Coimbatore.

Sri A. W. A. Joachin, Director of Agriculture, Ceylon.

Sri Thomas D. Clark, M.A., Ph.D., Professor of Animal Husbandry in University of Kentucky, United States of America.

Dr. E. K. Janaki, Officer on Special Duty, Botany Survey of India.

Dr. Trueman, Canada.

Sri Coomaraswamy, Ceylon.

Sri K. N. Anantaraman, I.C.S., Director of Fisheries.

Dr. P. C. Young, Head of UNESCO, South Asia Science Co-operation Officer.

Sri W. R. Crocker, High Commissioner for Australia, Delhi.

Dr. H. Grillo, Secretary-General for Agriculture in the Federal District of Rio-De-Janero, Brazil.

Diploma Course in Horticulture.—The Post Graduate Diploma Course in Horticulture which was run by the Agricultural Department so far has been affiliated to the University of Madras. The Course will be conducted under the control and discipline of the Principal, Agricultural College and Research Institute, Coimbatore, from 1953-54 academic year.

Changes to the existing Regulations of B.Sc. (Ag.).—The revised regulations, scheme of examination and Syllabus of B.Sc. (Ag.) Course as adopted by the Joint Board of Studies held at their Meeting on 18th July 1952 were considered and approved by the Academic Council and the Senate during the year. The revised regulations have been brought into force from the academic year 1953-54. The main change in the regulations pertains to the provision of intensive practical training in Agriculture for a period of six months at one of the agricultural research stations or an approved Farm. The training will be given to the students at the end of the second year from July to December.

VI. INTENSIVE CULTIVATION SCHEME UNDER THE GROW MORE FOOD PLAN.

The Madras State is normally deficit in foodgrains and the deficit is made up by imports from other parts of India and from overseas, before World War II the State was importing about 5 lakhs tons of foodgrains annually. The cessation of imports necessitated the launching of a grow more food campaign to step up foodgrain production. This State was the first to launch a grow more food drive by (i) increasing production on land already cultivated by using improved seeds and better manures, (ii) bringing new areas under food crops, increasing area under double crop cultivation, and cultivation during the off season.

Till the year 1946, the grow more food campaign was in the form of several inducements and concessions to increase acre-yield of grain crops, increasing the area under irrigated and rainfed foodcrops and to encourage production of accessory crops like vegetables, sweet potato, tapioca, etc.

During 1947, the Government sanctioned a five-year plan aimed at securing additional production of foodgrains from Agricultural and Irrigation schemes. In March 1949, the Government of India announced their decision to stop import of foodgrains from overseas after 1951. Consequently the Government of Madras reorientated their food production plan and re-organized their administrative machinery with a view to maximise food production. The several schemes under the old five-year plan were continued in the form of a new plan called the "Two-year Food Production Plan. This was later enlarged to an emergent three-year plan of intensive cultivation scheme for the years 1949-50 to 1951-52. This plan represented a co-ordinated and integrated effort by the Government under a unified authority, the Commissioner of Food Production.

The two-year plan was estimated to cost Rs. 3.5 crores with an Estimated additional production 5.87 lakhs of tons by 1951 and over the production of 1948-49. The total expenditure on the plan was estimated at Rs. 21 crores out of which a sum of Rs. 17.5 crores was recoverable from farmers by the sale of seeds, manures, collection of hire charges on agricultural machinery, etc. The net cost of Rs. 3.5 crores was to be shared between the Government of India and State Government on certain basis. The Food production plan consisted among others of the following agricultural schemes :—

- (i) River pumping schemes.
- (ii) Supply of oil engine pumpsets to ryots on hire.
- (iii) Supply of pipes and fittings to ryots for privately purchased oil engines and electric motors.
- (iv) Supply of oil engines and electric motor pumpsets under the hire-purchase system.
- (v) Supply of tractors on hire and on hire purchase.
- (vi) Distribution of iron and steel for agricultural purposes.
- (vii) Tube wells with filter points.
- (viii) Distribution of sulphate of ammonia.
- (ix) Subsidised distribution of Phosphatic fertilisers.
- (x) Rural compost.
- (xi) Urban compost.
- (xii) Green manure seeds—(distribution).
- (xiii) Improved paddy seeds—(distribution).
- (xiv) Improved millets seeds—(distribution).

- (xv) Improved pulses seeds—(distribution).
- (xvi) Control of pests and diseases of crops.
- (xvii) Agricultural staff—Comprehensive staff scheme.
- (xviii) Supply of planting material of sweet potato, tapioca.
- (xix) Model farms.
- (xx) (1) Extension propagandists and connected staff.
- (2) Community projects.
- (xxi) Crop competitions.

Prior to 1949-50, the different schemes were being administered by the Director of Agriculture. In May 1949, the Government appointed one of the members of the Board of Revenue the Commissioner of Civil Supplies also as the Commissioner of Food Production with a view to provide unity of purpose and direction in respect of the execution of Grow More Food schemes under the Departments of Agriculture, Co-operation, Industries, Engineering, Fisheries, Public Works and Irrigation. At the Government level, a Cabinet Committee for food production was constituted with the Chief Minister as Chairman and the Ministers in charge of the Departments concerned with food production and the Minister for Finance as members. The Commissioner of Food Production and ex-officio Secretary to Government in the Food and Agriculture (Food Production) Department is the Secretary to the Committee. The Committee sanctions food production schemes obviating delays involved in the usual procedure. It also reviews the food production policy and programme as well as the progress and execution of the schemes periodically.

At the district level the Collectors co-ordinate the activities of the different departments and watch the implementation of the schemes. In each district there was a food production committee consisting of officials and non-official representatives with the Collector as the chairman.

REVIEW OF THE GROW MORE FOOD ACHIEVEMENTS DURING 1949-50 TO 1951 AND PLANS FOR THE FUTURE.

During the year 1949-50 the total extent brought to beneficial use as verified by the Revenue officers under both works schemes and supply schemes was 26.42 lakhs of acres against an original target extent of 27.76 lakhs of acres. An additional production of 0.99 lakh tons was also verified against a total anticipated additional production of 1.82 lakhs tons based on the number of works completed and the quantities of seeds fertilizers, etc., actually distributed up to the end of March 1950.

During 1950-51 the total extent benefited and the additional production realized as verified by the Revenue officers under all the intensive cultivation schemes were respectively 22.65 lakhs of acres and 1.82 lakhs of tons against the respective finalized targets of 24.89 lakhs of acres and 2.68 lakhs of tons based on the units of works and supplies actually achieved up to the end of March 1951.

In 1951-52 a total extent of 24.22 lakhs acres was brought to beneficial use under all intensive cultivation schemes against a target of 37.01 lakhs acres. The additional production of cereals realised, as verified by Revenue officials, was 2.19 lakhs tons against a finalized target of 4.35 lakhs was based on the units of works and supplies actually achieved up to the end of March 1952.

The gap between the figures of actual additional production and the finalized targets for the above years is mainly due to the general failure of the monsoon in the State. These figures of additional production represent

those recorded by the local Revenue officers after field inspection wherever possible and in other cases by enquiry about the utilization of the Grow More Food aids.

All the intensive cultivation schemes implemented in this State under the three-year food production plan, 1949-50 to 1951-52 with the exception of a few miscellaneous schemes of minor importance (like the registered model farms, scheme for honorary propagandists and scheme of subsidy for rural compost making) are being continued under the five-year plan drawn up by the National Planning Commission. The last year of the three-year food production plan is the first year of the five-year plan (1951-52 to 1955-56).

The primary aim of the five-year plan is to increase agricultural production. The five-year plan is expected to result in an additional production of about 8.6 lakhs tons of rice and millets in the State at the end of 1955-56.

This is the second year of operation of the five-year plan. The following schemes were in operation during the year:—

- (1) River pumping schemes.
- (2) Supply of oil engine pumpsets to ryots on hire.
- (3) Supply of pipes and fittings to ryots for privately owned oil engines and electric motor pumpsets.
- (4) Supply of oil engine and electric Motor pumpsets under hire purchase system.
- (5) Supply of tractors on hire.
- (6) Supply of tractors on hire purchase system.
- (7) Tube wells with filter points.
- (8) Distribution of sulphate of ammonia.
- (9) Urban compost.
- (10) Green manure seeds distribution
- (11) Improved paddy seeds.
- (12) Improved millets seeds.
- (13) Improved pulses seeds.
- (14) Control of pests and diseases of crops.
- (15) Community projects.
- (16) Crop competition.

I. River pumping schemes.—This scheme was drawn up for its benefits in increasing rice production by providing irrigation water for a group of ryots in a whole village. In 1952 Government decided that the river pumping schemes should be worked only through co-operative societies and that new schemes should be started only if the Registrar of Co-operative Societies is not able to form societies, the Agricultural Department themselves could run them if the ryots benefited agree to meet the entire cost of the scheme. Till December 1952, no Co-operative Societies could be organized and Government ordered that the Agricultural Department could run them on a no loss no profit basis. In the intensive cultivation schemes for 1953-54 it was proposed to complete 50 river pumping schemes. One Assistant Agricultural Engineer was sanctioned and the special staff was continued. The proposals on land have to be re-examined to see whether

the beneficiaries are prepared to take up the schemes on a no loss no profit basis. The schemes were in operation in 1952-53 and the results are indicated below :—

Centre of operation.	Area benefited in 1952-53.	Estimated additional production.
	ACS.	TONS.
Pinayur (Chingleput district)	180	90
Nelvoy (Chingleput district)	200	100
Karimbedu (Chittoor district)	111	120
Maltour (South Kanara district)	110	113
Sajipanadu (South Kanara district)	41	27

The ryots benefited by the scheme at Pinayur and Nelvoy have requested to have them on a permanent basis. The scheme at Sajipanadu was taken up late in the year. Karimbedu scheme was discontinued after the recent rains.

II. Supply of oil engine and petrol driven pumpsets to ryots on hire.—The department has 767 oil engine pumpsets and almost all of them were on hire. There was a keen demand for these due to general failure of rains. The hire charges for these units have been revised in December 1952 as follows :—

	With driver.	Without driver.
For oil engine sets below 16 h.p.	Rs. 4 per day (8 hours.)	Rs. 2 per day (8 hours.)
For oil engine sets of 16 h.p. and above.	Rs. 5.	Rs. 3.

The purchase of 60 numbers of indigenous and 15 numbers of imported engines were sanctioned for 1952-53, but no new units were acquired. Government have permitted the sale of 25 per cent of the hire units to the ryots to meet the demand from users for their sale. A one-third rebate on hire charges collected on these units to the purchaser has also been sanctioned. The use of oil engine pumpsets on the Nilgiris for lifting water from mountain streams has become popular.

Thirty petrol driven sets were given on hire during the year.

Pipes and pipe fittings.—This department continued to acquire pipes and pipe fittings for meeting the demands of ryots. These were distributed to farmers on a no loss no profit basis for pumping and other agricultural needs. A total quantity of 702,877 feet of galvanized iron pipes of 1½ inches to 4 inches sizes was acquired in 1952-53 and a quantity of 96,211 feet of pipes from the whole stock held in the depots was distributed as detailed in Appendix No. 11. The low sales are due to the fact that the Government of India in the middle of 1952 permitted the stock holders to directly sell 50 per cent of their stocks without permits. In January 1953, pipes were fully decontrolled and the prices slumped. The quarterly indents were discontinued from the third quarter on 1952. Pipes are now sold at prevailing market rates freely to all indentors. Government have also directed all Government and quasi-Government departments to take their pipe requirements from the Agricultural department.

III. Schemes of supply for oil engines and electric motors under hire purchase system from the Central Agricultural Engineering Stores, and supply centre was in operation during the year. Government sanctioned some additional staff for this work. In G.O. No. 8, Food and Agriculture

(Food Production), dated 6th January 1953, Government sanctioned the scheme as follows :—

	Oil Engine pumpsets.	Electric motor pumpsets.	Expenditure. RS.
Intensive cultivation areas ..	500	200	25,58,580
Non-intensive cultivation areas ..	275	165	14,36,719
Total ..	775	365	39,95,299

Under this scheme 117 electric motors (cost Rs. 62,141) and 106 oil engines (cost Rs. 2,48,080) were purchased and supplied to ryots during the year. The amount of loan instalments collected during the year was Rs. 6,69,206 and the balance outstanding as on 30th June 1953 Rs. 1,16,779.

Filter point tube wells Scheme.—The scheme for sinking of 100 tube wells in Tanjore district to encourage ryots to extend paddy cultivation in kuruvai season and to raise seedlings in time and to enable the cultivation of cotton in the rice fallows in summer was worked till 10th December 1952 when the target of 100 was reached. In March 1953, Government have sanctioned the continuance of the scheme on an expanded scale for the installation of 600 filter point tube wells in the districts of East Godavari, West Godavari, Guntur, Nellore, Chingleput, North Arcot, South Arcot, Tanjore, Tiruchirappalli, Madurai, Ramanathapuram and South Kanara. The work on this was in progress from 1st April to 30th June 1953. Government also sanctioned Rs. 15 lakhs for granting loans to the ryots at Rs. 2,500 per individual for purchase of pumping machinery for the filter point tube wells sunk on their lands. These loans are recoverable in five annual instalments at 5½ per cent interest. The outturn of work up to 30th June 1953 is indicated below :—

District.	Target.	Number sunk.	Number of loans sanctioned.
West Godavari	50	87	59
East Godavari	90	95	95
Nellore	55	57	57
Guntur	70	107	107
Chingleput	40	40	12
North Arcot	45	51	45
South Arcot	45	48	20
Tanjore	75	80	64
Pattukkottai	25	24	24
Tiruchirappalli	50	73	54
Madurai	25	35	24
Ramanathapuram	30	30	22
Total ..	600	725	583

Each filter point is able to command 10 acres of continuous cropping in the year, and an additional short crop of paddy can be grown in summer or crop like groundnut or cotton, if required.

Chemical fertilizer—Ammonium sulphate.—The Government of India, Ministry of Food and Agriculture, changed the reckoning of the fertilizer year from the fasli period July-June to the calendar year January to December, with effect from 1st January 1950 and this arrangement is being continued for this financial year also.

The calendar year 1952 started with a carry-over of 3,925 tons. The quantity of sulphate of ammonia asked for from the Centre for the year 1952 was 150,000 tons, but subsequently Government allotted a quantity of 10,000 tons for distribution to Community Project. To compensate the short supply anticipated from Messrs. F.A.C.T., Limited, Alwaye, during January to March 1952, an additional quantity of 3,000 tons was asked to be supplied from the Centre in addition to the 40 per cent production, viz., 7,000 tons from F.A.C.T., Limited, Alwaye. Thus the total allotment from the Centre amounted to 1,63,000 tons and from Messrs. F.A.C.T. 7,000 tons (total 170,000 tons). Against the above Government of India were supplying to this State only small quantities, i.e., less than 4,000 to 5,000 tons each month from January to end of May 1952. Soon after the period when the south-west monsoon season was in progress, there was great demand for fertilizers. This department could have distributed more stocks if the Central Government had supplied the stocks according to schedule drawn up and sent to Government of India in the beginning of the year. From January 1952 to end of July 1952, the receipts from Government of India through imports amounted to 45,962 tons only. From August to end of December 1952, the Government of India by availing themselves of the American Aid Programme, through which they were able to get large quantities of American sulphate of ammonia have supplied a total quantity of 68,525 tons. During this period, a quantity of 23,070 tons was also supplied under non-T.C.A. programme.

The Sindri Fertilizer Factory started supplying sulphate of ammonia from April 1952 and up to end of August 1952, they supplied a quantity of 13,410 tons and the balance 39,136 tons between August and December 1952.

Messrs. F.A.C.T. Limited, Alwaye have supplied from January to end of July 1952 a quantity of 1,230 tons and during August to end of December 1952 a quantity of 6,172 tons. From this it may be observed that during the first half of the year 1952, the State Government was supplied less than the scheduled quantity, while in the second half of the year, the State Government was supplied with over 60 per cent of the scheduled quantity as per figures furnished below :—

Receipts during January to end of July 1952 from all sources including F.A.C.T., Limited.	Receipts during August 1952 to end of Decem- ber 1952 from all sources including F.A.C.T., Limited.	Total.
60,602 tons.	136,933 tons.	197,535 tons.

Towards the end of the year 1952, Government of India have also intimated the State Government that the unsupplied quota of about 26,455 tons against 1951 allotment should also be taken into account in the supplies made by them during the year.

Due to supplies made behind schedule (a) during the non-manuring season, (b) failure of the north-east monsoon in southern districts, (c) the high cost of sulphate of ammonia supplied by Sindri Factory, it was not found possible to distribute the fertilizer as expected and hence, there was a total carry-over of 106,000 tons of sulphate of ammonia in the several agricultural depots and with the clearing and forwarding agents on 1st January 1953.

This State was adopting the uniform price of Rs. 410 per ton from 9th December 1952 and this was reduced by Government to Rs. 335 per ton from 4th May 1953. The total loss of Rs. 64,59,567-7-8 due to the reduction in pool price will be met by the Government of India. Necessary

instructions have been issued to the District Agricultural Officers to give wide publicity about the reduction in pool price. After the reduction in the pool price, a quantity of 6,871 tons of ammonium sulphate was distributed during the months of May and June 1953 as against 5,834 tons of ammonium sulphate for the corresponding period of last year. The future off-take by farmers is expected to increase considerably on account of the price reduction.

Super phosphate.—The quantity of super phosphate allotted for the corresponding year to this State was 29,000 tons, against which orders for supply with different factories were placed for 9,988 tons. The Central phosphatic pool was discontinued with effect from 15th August 1952 and further supplies to this State were suspended. Against the above, a quantity of 7,992 tons of super phosphate only was received up to the receipt of orders discontinuing the phosphatic pool. After the discontinuance of the phosphatic pool, the procurement and distribution of super phosphate in this State was left to the normal trade channels and no quantity of super phosphate was purchased on Government account.

Consequent on the discontinuance of the phosphatic pool with effect from 15th August 1952, the department was left with a total stock of 12,000 tons of super phosphate which was then being sold in the departmental depots from Rs. 300 to Rs. 310 per ton. After the decontrol the price in the open market was competitive with the result that the rate already fixed by the department had to be reduced on a par with the local market rate. Hence the department had reduced the rate to Rs. 260 from Rs. 300 and again from Rs. 260 to Rs. 220 per ton. On account of the reduction of prices at Rs. 260 per ton and subsequently at Rs. 220 per ton, the total loss to Government is Rs. 6,47,574.

The subsidy scheme which was introduced by Government from 1st April 1949 by which super phosphate, etc., was asked to be sold at half cost to ryots, the other half being borne by Government of India and the State Government on 50 : 50 basis was reduced to 25 per cent with effect from 1st April 1952. This concession was also withdrawn and super phosphate ordered to be sold at full rate as per Government Memorandum No. 9359, F.P.-IV/52, dated 4th June 1952.

The sales effected by the Agricultural Department during the year 1952-53 through their departments, tender firms, co-operative societies, etc., as compared with the previous years are furnished hereunder :—

	1952-53.	1951-52.	1950-51.	1949-50.	1948-49.	1947-48.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
Ammonia sulphate..	85,511	80,401	83,188	54,444	50,658	33,982
Super phosphate ..	7,823	14,028	13,969	14,321	3,050	2,806

From the quantity totals furnished above it will be observed that demand from agriculturists for artificial fertilizers has been steadily on the increase during the last 5 years, ever since the department undertook to do both the work of propaganda and distribution. The application of such concentrated fertilizers is becoming more and more common for different kinds of crops in all districts. There is no longer the same lurking fear and doubt that used to be prevalent formerly in certain quarters that such extended use of inorganics is detrimental to the soil and of doubtful benefits. Crop sampling tests conducted over the different districts have distinctly proved that such intensive and concentrated manuring is definitely profitable to all crops.

Under the National Planning Programme drawn up for the five year period 1951-52 to 1955-56 it is proposed to arrange for the distribution of the undermentioned quantity of chemical fertilisers.

(1)	Ammonium sulphate.	Actuals allotted.	Super phosphate.
	TONS.	TONS.	TONS.
1951-52	116,000	38,545	28,000
1952-53	120,000	1,97,535	28,000
1953-54	130,000	..	33,900
1954-55	140,000	..	33,900
1955-56	159,000	..	33,900

Intensive Manuring Scheme.—Rice is the principal staple food crop of this State and it is in respect of this cereal that there is acute world shortage. It is obvious that the concentration of chemical fertilizers in areas with assured water-supply offers the best means of stepping up food production in this State. At the suggestion of the Government of India, the intensive manuring scheme with loan facilities was first started in 1950-51 and was implemented in nine districts where assured flow irrigation facilities are obtained. Under the scheme, ryots are given interest-free loans at Rs. 25 per acre subject to a maximum of Rs. 200 per head for the purchase of chemical fertilizers for application to paddy crops. The loans are recovered after the harvest of the long term crop along with the March kist. From the point of view of the maintenance of soil fertility, a linked up distribution of ammonium sulphate and super phosphate in the ratio of 2:1 or 3:1 was encouraged out no official pressure was brought to bear on the ryots to purchase super phosphate in this ratio.

INTENSIVE CULTIVATION SCHEMES—1952-53.

Statement showing the distribution of Grow More Food aids from 1st July 1952 to 30th June 1953.

Targets.			Name of scheme.	Achievements.		
Units to be distributed.	Area to be covered.	Estimated additional production.		Units distributed.	Area covered.	Additional production anticipated (Tons).
(1)	(2)	(3)	(4)	(5)	(6)	(7)
160	1,280	640	Oil Engines	2,514	20,112	10,066
3,000	15,000	7,500	Electric Motors <i>caes section</i> ..	1,207	6,035	3,017
1,500	12,000	6,000	Oil Engines	508	3,677	1,835.5
500	2,500	1,250	Electric Motors			
35	110,000	12,875	Clearance and Reclamation of Land by Tractors.	713	33,071	5,986
156,000	4,368,000	312,000	Ammonium Sulphate	85,511	2,394,303	171,022
23,000	..	24,166	Phosphate Fertilisers	7,823	..	6,319
109,947	21,989	2,749	Rural Compost	112,671	22,534	2,817
15,160	851,140	57,000	Paddy Seed	11,139	501,255	33,566
2,325	595,000	20,071	Millet Seed	252	37,800	717
77	18,340	570	Pulses Seed	181,675	5,624	189
40	90,000	8,036	Green Manure Seed (<i>Sesbania</i>) ..	42	94,080 For manure 186,220 For seed as border crop.	8,400

During 1951-52 the intensive manuring scheme was extended to include all the districts in the State except Anantapur. A sum of Rs. 87.51 lakhs was sanctioned by Government and the amount actually disbursed was 71.03 lakhs of rupees. The unfavourable seasonal conditions and the unsatisfactory stock and supply position of ammonium sulphate have stood in the way of attaining the target aimed at.

During 1952-53 the intensive manuring scheme was continued with a sanctioned amount of Rs. 82.01 lakhs of rupees and Government of India granted a loan of one crore to finance the intensive manuring scheme. Against the above a sum of Rs. 77,20,629 was distributed as loans for purchase of chemical manures up to 30th November 1952. The only change in this year is that Government have charged $4\frac{1}{2}$ per cent interest per annum to the ryots on the purchase of fertilizers on loans.

Manure mixing.—The Madras Manure Dealers' Licensing Order, 1949, and the Madras Manure Mixture Quality and Price Control Order, 1950, which were in operation from the year 1949 and 1950 respectively have been annulled by Government with effect from January 1953—vide G.O. Ms. No. 14, Food and Agriculture Department, dated 5th January 1953, and the connected staff employed in that connexion disbanded with effect from the middle of January 1953.

URBAN COMPOST SCHEME.

The Urban Compost Scheme was in operation under the Inspector of Municipal Councils and Local Boards in charge of a Compost Development Officer. All the municipalities in the State except Cochin continued to manufacture compost. Thirty-two notified panchayats started the work increasing their number from 351 to 383. A total quantity of 307,630 tons of compost was prepared during the year and a quantity of 211,413 tons was sold. The production has exceeded the target by 7,630 tons. A revised target of 4 lakhs tons have been fixed for 1953-54 for the State. The lack of seasonal rains in several districts affected the distribution of compost. The compost week was celebrated during October 1952 in almost all municipalities and panchayats. As resolved by the State Compost Development Committee individual cases of local bodies where distribution of compost directly to ryots or through co-operative marketing societies at sale price fixed by the Price Fixation Committee had become difficult. Ripe compost was ordered by Government to be auctioned in small lots. Twelve municipalities and five panchayats have availed of this concession. Three meetings of the State Compost Development Committee were held during the year. Agricultural departmental lorries were hired out for transport of compost in four districts. Rolling shields for the municipalities and panchayats for the best work done in the manufacture of compost have been instituted. These will be awarded for the first time during Compost Week Celebrations in July 1954.

GREEN MANURE SEED DISTRIBUTION.

***Sesbania speciosa*.**—At a time when there is acute shortage of food especially of rice, manuring with green leaves ranks foremost in our programme of development. The rice grower is left to the necessity of raising a green manure crop. But he has to contend with some difficulties. He has to raise the green manure crop in the off-season after paddy harvest, i.e., February-March to May-June. This is the period of closure of canals when he has no facilities for irrigation. He has to depend on rain and it is very meagre in summer months. He has to protect his green manure crop from cattle trespass and watch it. To overcome these difficulties, *Sesbania speciosa* a quick growing leguminous green manure crop producing abundant foliage, successfully multiplied during the last year has been largely distributed during the year under report. The department has evolved cheap methods of growing it in lines in the paddy field along the margins, occupying no

extra area of cultivated land. In extensive rice areas like Tanjore, *Sesbania speciosa*, grown on paddy field bunds of the first crop, kuruva paddy has yielded up to 6,000 lb. of green leaf to manure the second crop. Against the target of 40 tons of *Sesbania speciosa* seed to be distributed during the year, a quantity of 42 tons was distributed to cover an area of 94,080 acres resulting in an increased production of 8,400 tons of rice. Besides 186,220 acres of mainly paddy land were sown with *Sesbania* on lines for seed purposes, and a quantity of 140 tons of seed collected for further expansion.

Improved paddy seed multiplication and distribution.—Our deficit being essentially one of cereals the distribution of improved crop seeds which alone will increase the yield by about 10 per cent to 15 per cent over local seed is an important item of the intensive cultivation schemes. The department has over 172 improved strains of paddy suited for different districts and different local conditions and seasons. Some of these are cosmopolitan strains. The strains largely in demand are multiplied and distributed to farmers so that they could use pure seeds and step up their output of foodgrains. Nucleus improved seeds produced on Agricultural Research Stations are multiplied in two stages and distributed to farmers through the several depots by the department. Care is taken to maintain purity of seed and high germination capacity. A premium of 10 per cent over the local market rate was paid to the seed farm ryots to enable them to give clean dry seed to the department. This is subject to the condition that the open market rate does not exceed the village site price fixed during control period by 10 per cent. Half of the premium thus paid was recovered through sales to the ryots and the balance subsidised by Government. Rogueing charges for weeding out inferior plants in the earhead stage, at rates ranging from Re. 1 to Rs. 4 per acre were also paid to the seed farm ryots under the scheme.

The scheme for the grant of special interest-free loans to seed farm ryots sanctioned and in operation during the previous year, was discontinued from 19th September 1952. The scheme for the distribution of improved seeds through village co-operatives was sanctioned for the eight districts of East Godvari, Nellore, Guntur, Tirunelveli, Madurai, Coimbatore, South Kanara and Malabar during the previous year was extended to the districts of Visakhapatnam, Srikakulam, West Godavari, Krishna, Kurnool, Tanjore, Tiruchirappalli and South Arcot from 8th April 1953. The distribution of improved seeds in interior village through selected seed farm ryots on commission basis was in operation in all the districts during the year till 7th March 1953 was discontinued from 6th May 1953 due to unsteady markets and unwillingness of ryots to keep stocks and sell at leisure. The system of seed exchange by which ordinary varieties are exchanged for improved seed was working in the four selected districts of Chittoor, North and South Arcot and Chingleput. Twenty-five tons of improved paddy strains were so exchanged.

During the year, the following seed farms were raised under paddy:—

Primary—9,627 acres.

Secondary—33,621 acres.

A quantity of 11,898 tons of paddy seed was procured for distribution and a quantity of 11,139 tons was distributed during the year to cover an area of 501,255 acres and estimated to give an increased output of 33,566 tons of rice.

Distribution of improved millet seed.—The distribution of improved millet seeds like Sorghum, Ragi, Cumbu, Tenai forms an important item of seed distribution. Seed farms as shown below were run during the year:—

Millets.—Primary—4,483 acres; Secondary—7,355 acres.

A quantity of 452 tons of improved millet seeds was procured for distribution from seed farm ryots and 252 tons were distributed covering an area of 37,300 acres resulting in an increase in production estimated at 717 tons of millets.

Distribution of improved strains of pulses.—Forty-six acres of primary seed farms and 195 acres of secondary seed farms were run during the year and 1 ton 161 lb. of improved pulses seed was procured during the year. Nineteen tons of pulses seed were distributed to cover an area of 5,624 acres resulting in an estimated increased production of 188 tons.

Tractors on hire and hire charges.—There were 302 tractors in the State out of which 137 had bull dozer attachments. The tractors covered an area of 52,291 acres for ploughing, levelling and harrowing. The bull dozers worked for 138,829 hours. The disposition of the tractors, their outturn and hire charges are given in the appendices to this report.

Tractors on hire purchase.—This scheme aims at supplying tractors together with matched implements on instalment repayment system, spread over 7 years. So far 34 tractors have been supplied under hire purchase system and during the year 1952–53, 28 were taken delivery of by ryots.

Full particulars on the distribution of tractors, pipes, etc., and subsidiary uses to which the tractors were put to are given in the Chapter on Agricultural Engineering and appendices.

CONTROL OF PESTS AND DISEASES OF CROPS.

The scheme for the control of pests and diseases of crops is in operation since January 1949 as part of the Grow More Food Plan with a special staff of four Plant Protection Officers and plant protection assistants in each district. Two of the Crop and Plant Protection Officers are stationed at Coimbatore and two at Bapatla at one each for Entomology and Mycology work. Fifty-four maistris and fifty-four messengers at two for each district are working. Under the scheme insecticides and pesticides are generally sold through Agricultural department depots to the ryots at concessional rates. Fifty per cent of the cost price was charged till 1952 and during the year under report seventy-five per cent of cost price was charged and free technical advice is being given by the special staff of Crop and Plant Protection Officers and Assistants. This service has become very useful and popular. The demand for help in combating pests and diseases affecting crops and plants from the public is increasing. The sprayers, dusters and pesticides required were held in stock in all the depots of the department and reserve stocks were held in headquarters depots. From the commencement of the scheme Rs. 40,37,737 has been spent on this scheme.

Swarming caterpillar, grasshoppers, root grubs, jassid, stem borer, thrips, caseworm, hispa on paddy, red hairy caterpillars and earhead bug on cholam and cumbu, lady bird beetle and jassids on brinjals, cutworms on vegetables, early stem borer on sugarcane, black headed caterpillar on coconut were the important insect pests of crops tackled during the year. Pests of stored grain in Government depots and private granaries were also tackled successfully.

Among diseases combated during the year were blast and foot-rot on paddy, blast on ragi, smut on cereals and sugarcane foot-rot and mildew of chillies, wilt of groundnut, leaf spot of turmeric, on tobacco, mildew on several crops, mottle leaf gummosis and fruit fall on citrus, budrot and stem-bleeding of coconut.

Special staff for control of budrot of palms in the circars was working during the year. Pest Act for the control of budrot of palms which was in force in Krishna, West and East Godavari districts was discontinued from 9th December 1952.

Some important observations made during the year.—Urea when given either alone or in combination with a complete nutritional spray containing zinc, copper, manganese, magnesium and boron has some beneficial effect on citrus. Boron and nitrogen deficiencies were first observed in cases of collar rot, and root-rot.

Seven consignments of plants received from foreign countries, four despatched overseas on Government account and twenty-two parcels of flower bulbs and plants were fumigated at the Madras Port during the year. The Parasite Breeding Laboratory at Razole released 3,367,250 parasites against coconut pests. The Parasite Breeding Station, Kasaragod, started functioning during the year. Forty-one thousand, five hundred and five parasites were bred and made available for liberation.

The areas under food and other crops where control measures against pests and diseases were successfully adopted are as follows:—

Food and other crops—786,959 acres.

Fruit trees—991,393 numbers.

It is estimated that 47,004 tons of foodgrains were saved from loss by adopting control measures in time.

VII. COTTON EXTENSION PLAN FOR 1953-54.

The Cotton Extension Scheme, which was started in June 1950, was continued during the year. As in the previous year, the main items of work during 1952-53 were cultivating cotton in the single-crop wet lands during off-season, growing cotton mixed with other crops such as ground-nuts, chillies and ragi, distributing improved cotton seeds and selling pesticides to ryots at concessional rates. During the year, it was targetted to cover an area of 99,483 acres and to produce an yield of 75,011 bales of lint, over and above the actuals of 1951-52. Besides the local varieties, a quantity of 3,000 maunds of P 216 F variety and 2,500 maunds of H 420 variety of cotton seeds were imported for distribution during the year from East Punjab and Madhya Pradesh States respectively.

During the year, cultivation of cotton in the single-crop paddy lands during off-season (January-July) in the districts has become popular and ryots purchased about 3,016 maunds of P 216 F, an early duration variety, for sowing during the season. In spite of the limited irrigational facilities, about 9,760 acres were raised with this variety in the paddy lands during January-February 1953. Imported varieties, namely, "H 420" and Lakshmi which are best suited for the Ceded districts were also under distribution, for sowings as pure and mixed crops and the ryots of the area were much impressed with the performance of these varieties. The Grow More Food concessions, which were extended to cotton were in force during the year; propaganda for increasing cotton production was continued during the year through leaflets, radio talks, etc.

In spite of the very adverse season during the year an additional area of about 71,854 acres is estimated to have been covered with cotton and the yield thereon is estimated at about 35,019 bales. A special feature during the year is that the cotton control bill was placed in the Statute Book and

this will facilitate the raising of improved strains in a pure condition in specified areas during the coming years.

The Cotton Extension Plan for 1953-54 has since been sanctioned by Government, almost on the same lines as that of the previous year.

The improved seeds produced and distributed during the year were Co. 2 Madras Uganda—1, Karunganni—2 and 5, Westerns—1, Cocanada—1 and Lakshmi. A total of 38,501 imperial maunds of seeds were procured during the year and with the carry over of the previous year a total quantity of 39,713 imperial maunds of improved seeds were distributed during the year. The total expenditure incurred is Rs. 3.14 lakhs.

There were no very serious outbreaks of pests and diseases during the year and the area covered under plant protection measures was 4,149 acres. Other achievements during the year under the different items of the cotton extension work—

Reclamation of waste and fallow lands.—Against a target of 4,700 acres, 10,496 acres have been achieved.

Extension of area by replacement of oilseeds and other crops.—Against a target of 4,500 acres, 42,613 have been covered.

Double cropping.—The area could not be achieved in full due to lack of water-supply in Mettur reservoir and early closure of canal water-supply.

VIII. RESEARCH.

The research work under the department is being carried on at the Agricultural Research Institute and the several breeding stations or farms attached to that institute at Coimbatore as well as at the 49 agricultural research stations and regional research centres throughout the State. The review of the research work done during the year under report is presented below under the following heads:—

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

1. RESEARCH COUNCIL.

The Research Council consists of the heads of different research sections with the Principal and the Vice-Principal of the Agricultural College, Coimbatore, as President and Secretary, respectively. It scrutinizes the programme of work and progress reports on research work done at all centres. During the year under review 39 meetings of the Research Council were held when besides examining the half-yearly and annual progress reports and technical programmes of all research stations and schemes under execution, the Council also undertook the scrutiny of the cropping schemes of

some of the Agricultural Research Stations and five fresh schemes of research intended to be forwarded to the Indian Council of Agricultural Research and Commodity Committees for sanction.

2. AGRICULTURAL CHEMISTRY.

1. *Analytical and Advisory.*—This branch of the section has been catering to the requirements of ryots, Government departments, industrial concerns and the general public by analysing soils, manures, irrigation waters, food-stuffs, fodders and other miscellaneous samples and giving advice on the basis of such analyses. During the year 3,508 samples were registered for analysis as against 2,677 in the previous year while the disposals during the current year numbered 2,764 as against 2,235 in the preceding year. The following table furnishes the details of the samples disposed of under various items :—

Nature of sample.	Agricultural department.	Other Government departments.	Private parties.	Total.
1 Soil	1,393	31	80	1,504
2 Manures	144	37	127	308
3 Waters	101	3	21	125
4 Food stuffs and fodders	442	126	..	568
5 Plant products including grain and strains.	160	..	..	160
6 Miscellaneous	82	17	..	99
Total ..	2,322	214	228	2,764

A sum of Rs. 2,858 only was received during the year as analytical fees from ryots and other private parties as against Rs. 4,953 during the previous year. This decrease in receipts is due to a corresponding reduction during the year in the number of samples received from private parties.

Among the various items analysed special mention may be made of the following :—

(1) Analysis of soil and water samples from the bore-wells ayacut in Viruddhachalam taluk of South Arcot district, showed the suitability of the waters for irrigation. In the heavy clay soils however harmful amounts of water soluble salt were found to be present in the Aziznagar and Comangalam areas. These salts can be leached out by improving the drainage.

(2) Pre-harvest and post-harvest soil samples from the Tanjore delta revealed that the nutrient status of the soils did not suffer as a result of growing cotton in paddy fallows.

2. *Research*—(I) *Soils*—(1) *Rapid soil tests and their application to manuring of crops.*—To enable the analysis of a large number of samples rapidly for advisory work, a method for the rapid estimation of P_2O_5 in the delta soils has been tested and found very satisfactory. The value of the method will need to be confirmed now on the basis of large-scale field tests.

(2) *Soil.*—To understand the soil conditions in their right perspective a few areas were surveyed and intensively studied. Gypsum was found in the course of such studies to occur in black soils in Palladam taluk in large amounts and this information was passed on to the owner of the land.

(3) *Reclamation of alkaline lands in the Cauvery-Mettur Project Area.*—To evolve an economical method of soil reclamation with locally available materials, has been the aim of the department for a long time. Heavy dose of green leaf in conjunction with lime or gypsum has already been found beneficial. The strain S.R. 26-B was also found suitable to these soils. Ryots have taken advantage of these findings in an increasing measure during the year and have grown successful crops.

(4) *Studies on laterite soils.*—Immobilization of soluble phosphates applied as manure, has been a serious problem in laterite soil improvement. Application of organic matter at 7,500 lb. per acre with lime (3,000 lb.) was found to give the best results during the studies conducted in the year under report.

(5) *Studies on the black cotton soils of the Tungabhadra Project Area.*—It has been further confirmed during the year that these soils could be irrigated sparsely or heavily without fear of salts rising to the surface. Good drainage has, however, been found necessary in lower regions.

(6) *Studies on the soils of the Lower Bhavani Project Area.*—A farm has been opened at Satyamangalam and samples of soils and waters were analysed to study the influence of irrigation on these soils.

II. *Manures and Plant Nutrition*—(i) *Permanent manurial experiments—Plant Nutrition of dry and irrigated crops.*—To find out the function of major nutrients above and in combination a long range experiment is being conducted for more than 40 years. The findings so far recorded are (1) phosphates increase grain yield, (2) complete manure gives better yield and (3) potash is not necessary for most of the crops grown in this experimental area. Soil moisture studies carried out at monthly intervals have indicated during the year that the moisture retaining power of the soil is increased more by cattle manure than by other fertilizers used in this experiment. There was also an indication that the effect of manure, season and irrigation was more pronounced on the microbial population and their activity than that of the crops. The value of organic manures in increasing the fertility status of the soils, as brought out from these studies is being emphasised to the ryot public in the course of departmental extension work.

(ii) *Determination of N. and P. requirements of the soil types of the paddy areas in Tanjore district.*—Trials were conducted on ryots fields and data on soil fertility status and other physico-chemical properties were collected in an effort to standardize the agronomic practices of this tract. Traverse work was completed and data for drawing a soil map have been secured.

The experiments have shown so far that for optimum paddy yields, over a basal application of 5,000 lb. of green leaf, application of ammonium sulphate and super phosphate to provide 30 lb. nitrogen and 30 lb. of P_2O_5 respectively is essential. These trials in a large number of fields belonging to ryots provide a visual demonstration of the benefits of the treatment advocated by the department.

III. *Green manures*—(1) *Common green manure crops and their comparative merits.*—From the data on green matter yield, yield of paddy and grain and straw, nitrogen and organic matter content of the soil and microbial activity, etc., gathered so far, it appears that leguminous green manure crops grown and ploughed *in situ* for a number of years have built up the soil fertility and appreciable yield increases have been obtained. Dainoha has been found so far to be one of the most desirable green manure crops as it can stand drought and salinity better than most other crops and fix maximum amount of N.

(2) *Selection of suitable strains of root nodule Bacteria for Specific legume inoculation.*—To obtain the specific bacterial culture for efficient nitrogen fixation and for increased crop yields, isolation of efficient strains of bacteria for all the pulses and green manure crops of the State was continued. The right type of cultures for every pulse and green manure crop of the State have been stocked for supply to ryots.

(3) *Green manure decomposition studies in swamp paddy soils.*—Experimental findings during the year are that green manure has direct manurial value and about two-thirds nitrogen contained in them are available for paddy. The drive for green manure which the department has undertaken gains added significance by the above findings.

3. PLANT PHYSIOLOGY.

(1) *Pre-treatment studies.*—To see how far it is possible to increase yields of crops by pretreating the seeds in solutions of suitable nutrient salts, work is in progress under a scheme of research. The rate of inhibition of phosphate and potash with presoaking periods of 4, 8, 12, 16, 20 and 24 hours in molar solutions of three types, viz., KH_2PO_4 , K_2HPO_4 and K_2PO_4 were studied. The maximum increase of 133 per cent in earhead weight was observed with 16 hours of soaking in molar concentrations of KH_2PO_4 . With longer presoaking periods the increase became progressively less. The work done so far shows that for each crop plant, there is a particular type and strength of nutrient solution that is most effective in improving growth and yield. Further trials are necessary before the results can be passed on with effect to the cultivators.

(2) *Plantomine experiments.*—The claims made by the sponsors of a proprietary product called "Plantamine" were tested under pot culture as well as under field tests with paddy and ragi crops at three different centres. The result showed that in no case the product plantomine was helpful in improving crop yields.

(3) *Weed control studies.*—To investigate the possibilities of controlling weeds by the use of chemical herbicides experiments on four important weeds, namely, *Cynodon Dactylon* (Hariali grass), *Cyperus rotundus* (Nut grass), *Trianthema Portulacastrum* and *Spergula arvensis*, treated with various herbicidal chemicals were carried out at different centres. There has been no reliable findings yet from these trials.

A new method was devised for a detection and estimation of very small amounts of herbicidal chemicals and their residual effect in the soil when applied to fields for weed control. This is expected to be of help in expediting research in the line.

(4) *Studies on seed viability and dormancy.*—A number of tests was carried out on green manure seeds, viz., *Crotalaria striata*, *Sesbania speciosa* and *Calapogonium species*, to find out suitable methods of improving the percentage of germination in freshly harvested seeds of these species. Grinding the seeds with sand in a mortar for five minutes was found to be a very effective method of improving the seed viability. The results have to be confirmed before they can be advocated as a practice to be followed by the ryots.

4. AGRICULTURAL ENTOMOLOGY.

I. *Pests of paddy*—(1) *The paddy stem-borer* (*Schoenobius incertellus* W.)—The experiments continued at the Agricultural Research Station, Aduthurai, have shown that three rounds of applications of sprays of B.H.C. 0.1 per cent and Parathion 0.025 per cent at the seed bed stage, followed by

another round at the preflowering stage gave a certain amount of reduction in pest incidence.

(2) *The paddy mealy bug* (*Ripersia Oryzoe*).—The nursery treatment with spray of B.H.C. DDT, HETP, Parathion, etc., did not give favourable results with reference to the incidence of the pest on the transplanted crop. Attempts were therefore made to control the pest soon after its manifestation in the fields. Application of sprays of Schieadan 0.75 per cent, Parathion 0.1 per cent and 0.2 per cent and B.H.C. 0.4 per cent on the infested "Soorai" patches in the field arrested the activities of this bug.

(3) *The paddy jassid* (*Nephotettix Bipunctatus* L.)—Preliminary trials on the comparative merits of sprays of parathion 0.025 per cent and DDT 0.1 per cent against this pest gave encouraging results from the point of view of bug mortality with both the chemicals.

(4) *Field rats* (*Bandicota bengalensis* G and H and *Millardia meltada* G.)—Investigations on the control of the rodents mentioned above were in progress at the Agricultural Research Station, Aduthurai. Application of baits of Dethmor and zinc phosphide under certain conditions proved ineffective against the mole rats. In the case of *Bandicota*, Bow trapping and catching by professionals, once again proved their superiority over poison baiting.

II. *Pests of cholam*—*The cholam fly* (*Atherigona indica*, M.)—Adopting a higher seed rate (24 lb.) per acre and subsequently thinning out the infested plants proved superior to the other cultural, manurial and insecticidal methods of control at Agricultural Research Station, Siruguppa.

III. *Pests of sugarcane*—*The sugarcane borers* (*Argyria sticticeraspis*, H. *Diatroea venosata* W and *Scirpophaga* sp.)—The data regarding the influence of weather factors on the incidence of the borers, mortality, etc., have been collected and sent to the Sugarcane Specialist, Bihar, for analysis and interpretation of results as required by the Indian Central Sugarcane Committee.

IV. *Pests of vegetables*—*The vein clearing disease of bhendi*.—The insect vector responsible for this disease has been established as the *abruodict-Bemisia tabaci*.

None of the treatments tried during the year gave any relief from this disease.

V. *Pests of fruits*—(1) *The fluted scale* (*Icerya Purchasi*, Mask).—The breeding and liberation of the predator beetle *Rodolia Cardinalis* Muls was continued on the Nilgiris and Kodikanal till 31st July 1952 when the scheme was closed down.

(2) *The san Jose scale* (*Quadstupitotus perniciosus* C.)—Sprays of 6 per cent Diesel Oil emulsion and a combined spray of 0.5 per cent sandolin A and 1 per cent Emphytan winter have given encouraging results against this pest.

(3) *The mango hopper* (*Idiocerus* sp.).—From the point of view of cost, it was found that sprays of parathion HETP and systemic insecticides did not stand a favourable comparison with DDT.

(4) *The fruit sucking moth* (other sp.).—The experiments with DDT and BHC were continued at Chathrapatti, Madurai district, on a field scale. Four rounds of application of DDT spray 0.1 per cent at intervals of three weeks, have given a certain measure of relief.

(5) *The orange thrips* (thrips sp.).—BHC spray and dust has been found quite effective in controlling this pest.

VI. *Trials in insecticides and Fumigants*—(1) *Control of coccids and aphids.*—The efficacy of the synthetic chemicals was tested against a variety of coccids and aphids. Sprays of Parathion 0.025 per cent proved to be

a specific against various species of coccids while HETP 0.1 per cent and systemic chemicals like pestox 3 syntam, scharadan, etc., practically annihilated the aphid population.

(2) *The effect of mixing DDT and BHC with seed material.*—Mixing BHC 5 per cent, DDT 5 per cent and Hortex 0.65 per cent dust with seven varieties of seed materials at the rate of 1 lb. of the chemical per 1,000 lb. and 500 lb. of seeds conferred immunity against store product pests for a period of three months. The viability of the seeds was not in any way affected.

(3) *Secondary infestation of aphids and mites as an aftermath of application of DDT and BHC.*—The incidence of secondary pests like aphids and mites was observed in all crops treated with BHC and DDT. Repeated applications of DDT brought about an infestation of aphids in the case of cotton and mites in the case of cucurbits. Indiscriminate use of DDT should therefore be avoided.

(4) *The action of methyl bromide and Killoptera on the viability and absorption of the poisonous elements by seeds with high oil contents.*—At dosage of 2 lb. per 1,000 c.ft. and 24 hours methyl bromide fumigation resulted in the retention of residual bromide by castor, cotton, gingelly and groundnut in quantities far less than the permissible level (50 parts per million). The viability of these materials was not affected by fumigation with methyl bromide or Killoptera. These two chemicals may therefore be safely used as fumigants for the treatment of oil seeds.

(5) *The action of DDT and B.H.C. against flies.*—BHC and borax either as dust or spray were found to appreciably reduce the emergency of flies when applied on their breeding grounds. BHC spray 1 lb. in 16 gallons proved lethal against the adults also.

(6) *Miscellaneous insecticidal trials.*—The use of BHC and parathion in the prophylactic treatment of nurseries proved promising against pests of paddy, chillies and brinjal. Treatment of seeds with BHC impaired their viability at higher dosages. Sandovit, Hexidole 950, RR and Lissopal were found to possess better powers of adhesion to the plants. None of the indigenous vegetable insecticides could stand a favourable comparison with the synthetic chemicals.

(7) *Live plant fumigation.*—Calcium cyanide at 1 lb. and methyl bromide at 2 lb. per 1,000 cubic feet for one hour were found to be the best dosage for adoption in live plant fumigation.

(8) *Adverse effects of synthetic chemicals—(a) Phytocidal action.*—DDT technical, BHC, Lindane, toxophene, chlordane, aldin, ideldrin, parathion Pestex 3 H and BFPO were tried as spray and dusts at different concentration on nine species of cucurbitaceous plants. The result showed that Lindane as spray or dust can be safely used. Toxaphene and chlordane proved to be highly phyto toxic.

(b) *Tainting of the produce.*—Application of technical BHC on most vegetable and fruit crops was found to interfere with the palatability of the harvested produce by imparting a peculiar taint. Lindane spray was quite safe for adoption in such cases.

(9) *The cotton boll worms.*—Sprays of parathion 0.025 per cent, BHC 0.1 per cent, BHC dust 10 per cent, DDT dust 10 per cent, DDT spray 0.1 per cent have given indications of control of those pests.

VII. *Bee-keeping.*—The first and second generation progenies of the selected colony have given a better performance with reference to honey yield than the parent. A total by 17 plants were noted as new sources of pollen and nectar.

VIII. *Adverse effects, if any, on the application of DDT on cotton.*—Two applications of DDT either as dust or spray were found to lower the yield. A perceptible increase in the aphid population was noted in these lots. A timely application of HETP increased the yields to a certain extent.

It has been found that the indiscriminate use of DDT on cotton is to be deprecated as that would lead to a reduction in yield.

IX. *Biological control—The Australian Predator*—(*Cryptolaemus montrouzieni* Muls).—The nucleus stock of the beetle was obtained from the Mysore Entomologist and was also collected at Anikorai in Nilgiris. Mass rearing was taken up with various species of mealy bugs as host material. The beetle has given encouraging results in the control of the neem scale-*Pulvinaria maxima* the brinjal mealy bug *Phenococcus insolitus* and a few other species of mealy bugs affecting fruit trees.

X. *Pest of stored products—Bionomics and control of Bruchids.*—Information on the food preferences of *Bruchus Chinensis* and on the life history of *caryoborus* and *pachymerus* were gathered.

XI. *Fundamental Research—Biological control as a supplement to the control of insects—Aphids.*—The seasonal occurrence of aphids and their predator were noted on a variety of crops grown on the central farm.

XII. *Fumigation and phytosanitary work.*—About 377 bags of seed material were fumigated for the various specialists and rendered free of insect pests. About 690 bags dumnuts infested by the scolytid beetle coccotypes *dactyliperda* Fabr were of similarly treated with calcium cyanide dust for private parties. A total of 55 smaller consignments intended for despatch to other countries were examined and fumigated wherever necessary for the issue of phytosanitary certificates.

The findings recorded under this section have been passed on promptly to the plant protection staff, through whom they have either been disseminated to the cultivators or utilized to control the pests more effectively expeditiously and cheaply.

5. AGRICULTURAL MYCOLOGY.

I. *Disease of rice—(a) Blast—Piricularia oryzae—(i) Varietal resistance trials.*—The relative resistance of 300 cultures of rice to blast was assessed.

One highly resistant strain Adt. 25 has been released.

(ii) *Mode of infection.*—Experiments conducted confirmed the previous experiences that the disease was not seed borne.

(b) *Foot rot Fusarium moniliforme—(i) Varietal resistance.*—Out of 105 new cultures of rice tested, 16 exhibited low infection.

(iii) *Fungicidal trials.*—In all ten fungicides were under test for seed treatment and six of them, viz., Panogen, ceresan, experimental seed dressing, certoman, ceresan (Japan) and Agrosan G.N. were found useful.

II. *Cereal rusts—(a) Wheat rusts—Puccinia graminis, P. triticea, P. glumarum.*—Out of the 12 varieties of wheat tried at Coimbatore, three have been found to be high yielding and exhibiting low infection by black rust. On the Nilgiris Gabo continued to be popular and is being distributed to the growers.

Four rust resistant Kenya varieties have been obtained for trials.

(b) *Sorghum rust—Puccinia purpurea—Varietal resistance trials.*—Further observations on the incidence of rust on the cultures of sorghum revealed that 28 cultures included under 7 species exhibited low incidence. The spores

of the fungus are present in the air throughout the year. Some cultures of *Sorghum halepense* have been found to be susceptible to this rust.

(c) *Cumbu rust*—*Puccinia penniseti*—*Varietal resistance trials*.—All the agronomically useful cultures have been found susceptible to this rust. Two races of the rust have been observed. Three more alternate hosts of this rust have been found. Garlic juice was found to inhibit germination of uredospores.

(d) *Tenai rust* (*Uromyces setariae italicae*)—*Varietal resistance trials*.—All the cultures grown at the Millets Breeding Station, Coimbatore, were found to exhibit over 30 per cent infection. *Eriochloa procerea* was found to serve as a collateral host.

III. *Diseases of commercial crops*—*Cotton*—*Black arm* (*anthracnose* *Malysearum*).—Seed treatment with organo-mercuric compounds after dealing with sulphuric acid was found to be effective in controlling primary infection. Spraying cotton with bordeaux mixture led to a slight increase in the yield of kapas.

Betelvine wilt.—Betelvine wilt caused by *Phytophthora palmivora* was prevalent in a number of gardens in Tiruchirappalli district. The soil was drenched with bordeaux mixture, cheshnut compound or dithane Z.78 once in two months. There was no incidence of wilt in the treated plots while it was prevalent in the surrounding untreated areas.

IV. *Vegetable diseases*—*Brinjal wilt and Bhendai root rot*.—The host range of the four virulent isolates of *Fusarium* from brinjal was ascertained. Cheshnut compound Bordeaux mixture and 0.05 per cent urea applied to the soil reduced the incidence of wilt. Higher dosages of urea have been found to be harmful to brinjal. The culture D.B.7 of horsegram, No. 216 of blackgram, greengram of Udumalpet and cultures C.57 and C.521 of cowpea were found to be resistant to root rot.

V. *Diseases of ginger* (*Rhizome rot*).—The results of the previous year were confirmed and storage rot was controlled by pretreatment of the rhizomes with 0.25 per cent cerasan or 0.1 per cent mercuric chloride solution. Colloidal copper and cheshnut compound applied to the soil before planting gave the best yield.

VI. *Orange diseases*—*Limb breakage*.—Two fungi have been found to be associated with the affected parts. One of them was found capable of infecting the branches through wounds. Spray application of urea on the foliage resulted in better growth of the trees and reduction of deterioration.

VII. *Ergot of rye* (*Claviceps purpurea*).—Large scale production of ergot was continued. On the farm, 34 acres were sown to rye and this yielded 479 lb. of ergot and over 20,000 lb. of rye seed. A total of 500 lb. of ergot was produced at the Agricultural Research Station, Nanjanad, and by private growers.

VIII. *Areca stem breaking disease*.—A new station partially financed by the Indian Central Arecanut Committee was opened in August 1952 at Vittal in South Kanara for the investigation of this disease. Preliminary observations have shown that cracks developed on the south-western side of the stem of areca at different times. This is suspected to be due to sun scorch. Several methods of protection and prophylactic treatment are under trial.

IX. *Fungicidal trials*.—The proprietary fungicides placed on the market from time to time were tested and their merits for the control of the various diseases assessed. For the control of early blight of potato Dithane Z-78 has been found to be as good as Bordeaux mixture. For the treatment of

tikka leaf spot of groundnut, Dithane, Z-78, Bordeaux mixture and zinc sulphate, and copper sulphate have been found to be satisfactory.

The results achieved during the year were passed on to the plant protection staff for transmission to the cultivators.

6. AGRICULTURAL METEOROLOGY.

The Agricultural Meteorology Section was made permanent from 1st April 1953.

I. *All-India co-ordinated crop weather scheme*.—Collection of meteorological and crop growth data to predict the outbreak of pests and diseases and also to utilize the plant itself as a final indication of its yield was in progress, for the fifth year in succession in the six crop weather stations, viz., Coimbatore, Samalkota, Hagari, Pattambi, Aduthurai and Koilpatti and the crops assigned to each of them. The incidence of pests and diseases on these crops was recorded. The data were regularly supplied to the Director of Agricultural Meteorology, Poona, for analysis.

II. *Meteorological observations and analysis*.—Meteorological data were collected regularly at the observatory.

The data collected at Coimbatore as well as at the various agricultural research stations and districts were analysed for preparing forecasts.

III. *Collection of data on the incidence of pests and diseases*.—To predict the outbreak from a knowledge of weather conditions, micro-climatic observations were taken in the jassid infested cotton crop in the rice fallows at the Paddy Breeding Station. The data were compiled and are under study.

IV. *Miscellaneous*.—The following miscellaneous items of work were also attended to by this section:—

(1) The daily comparative statement of weather was maintained and sent every month to the Director of Agricultural Meteorology, Poona.

(2) Weather review was published every month in the Madras Agricultural Journal.

7. CROPS IMPROVEMENT WORK.

(a) Paddy.

Research work on paddy was carried on at the Paddy Breeding Station, Coimbatore and Agricultural research stations at Aduthurai, Ambasamudram, Anakapalle, Buchiredipalem, Mangalore, Maruteru, Palur, Pattambi, Pulla, Samalkota, Tirurkuppam and Wynaad.

i. *Release of strains*.—The following improved strains were released during the year:—

- (i) Adt. 25 Blast resistant Sirumani from Aduthurai.
- (ii) TKM Sanna Sornawari from Tirurkuppam.
- (iii) MGL 2 Bille Kayamma from Mangalore.
- (iv) Ptb 31 Elapapoochamban from Pattambi.
- (v) Ptb 32 Aruvakari from Pattambi.
- (vi) MTU 22 Pedda Kusuma from Maruteru.

2. *District trials*.—In South Kanara one Halluga culture gave 10 to 20 per cent increased yield and it is awaiting release.

3. *Pure line selection*.—At Coimbatore, selection work was in progress in Bairavaddu of Anantapur. Nucleus seed of the other important varieties of Wynaad and Gudalur as also of the important varieties of Ramanathapuram were maintained. A culture in Arikkirai is ready for release as strain.

At the Paddy Breeding Station, Mangalore, nine cultures in four varieties were in the final stages of trial. Two promising cultures in Pedda Atragada were multiplied. At the Rice Research Station, Tirurkuppam, 300 single plants were selected from Bairavadlu for comparison with the ryots' bulk. A number of cultures were in the various stages of trials against their respective standards.

4. *Hybridization*.—Evolution of short and medium duration, high-yielding blast resistant strains was in progress at Coimbatore. To improve the table quality of Co. 25 and 26, crosses were effected between Co. 25, 26, Adt. 2 and Co. 19 and the progenies were in different stages of tests.

5. *Drought resistance*.—From the crosses made between cultivated rices and wild rice varieties, a large number of progenies were studied at Tirurkuppam and Pattambi, and 1,389 promising cultures were carried forward for further tests.

6. *Evolution of short duration dormant strains*.—Dormant strains will be useful during wet harvests and in the effort to secure suitable dormant strains, nearly 1,300 F-2 progenies of 22 sets of crosses between dormant and non-dormant short duration strains have resulted in fixing up a number of progenies with dormancy.

7. *Deep water resistance*.—At the deep water rice station, Pulla T. 2205 (a variety from Assam), Burma Akkulu and A.R. 101-1 (again an Assam variety) were found to be good yielders during the year also when no floods were received. T. 2208 was found to be very tall growing and non-lodging for the second crop season PLR. 2, TKM. 3 and a cross progeny between Nallarl and Kasipichodi were found suitable. Crosses were effected between the Assam type 2205 and local strains of the first and second crop seasons.

8. *Miscellaneous*.—At Mangalore the evolution of non-lodging varieties for the first crop and non-deteriorating type for a second crop were among the main lines of work.

9. *Manurial experiments*.—At Tirurkuppam, green manuring of semi-wet paddy resulted in 46.1 per cent increased yields. Plots treated with night soil compost and Farm-yard manure were on a par and superior to no manure plots. In the optimum spacing experiment with sesbania 2" to 3" spacing gave the maximum yield. At Pattambi the plots manured with 1/3 groundnut cake and 2/3 Ammonium sulphate, yielded 27 per cent more than the control. Green leaf at 6,000 lb. and super to supply 60 lb. P₂O₅ yielded 27.6 per cent more than the control. Cattle manure recorded 12.9 per cent and green leaf 7.5 per cent increased yield as residual effect. At Mangalore phosphates in conjunction with green leaf yielded better than phosphates in conjunction with cattle manure.

10. *Cultural experiments*.—At Pattambi in Kodu trials, plots dusted with DDT. 5 per cent gave the maximum yield with minimum infection. In the insecticidal trials against stem borer, plots treated with BHC. 0.1 per cent gave the highest yield with least infection.

(b) Millets.

Work for breeding improved strains of millets were continued at Coimbatore and at the regional centres of work situated in the different parts of this State. The work on cholam, cumbu, ragi and tenai received more attention and was carried on at most of the centres. The minor millets varagu, samai, panivaragu and kudiraivali were dealt with mainly at Coimbatore.

(i) Cholam.

(a) *Evolution of high yielding strains*.—The following major rainfed varieties suited to the different tracts of the state received attention :—

- (1) Perimanjal cholam.
- (2) Talaivirichan cholam.
- (3) Irungu cholam.
- (4) Makkattai cholam.
- (5) Pyru jonna.
- (6) Tella jonna.
- (7) Patcha jonna.

Several improved cultures of these varieties were under various stages of trials. One selection of Talaivirichan cholam (A.S. 8008) and another from Periamanjal cholam, Irungu cross (A.S. 7081) have established their superiority over the local this year also and are to be released for general cultivation shortly.

(b) (i) *Improvement of the fodder quality of the major varieties of cholam*.—Evolution of high yielding strains with bold grains and juicy stalks were the objectives in the following varieties :—

- (1) Periamanjal cholam.
- (2) Talaivirichan cholam.
- (3) Sen cholam (irrigated).
- (4) Chinnamanjal (irrigated).
- (5) Vellai cholam (irrigated).

Promising selections with superior fodder quality have been issued for trial in the districts.

(ii) *Evolution of high yielding strains of Tella Jonna suited to Hingari and Mungari season, Tungabhadra Project area*.—The heavy black soils of Tungabhadra Project area have to be cropped with irrigated jonna and suitable types have to be evolved, as the existing types are unsuitable. Strain Co. 9 has been found suited to Mungari season. Promising selections were under yield trials, among which M. 47-3, M. 31 and M. 9-8-1-2 were found promising. These are being recommended to the project ryots.

(c) *Evolution of strains resistant to striga*.—The F₂ progenies of the crosses between striga resistant type from Africa and N. 1, H. 1 and G. 1 were under various stages of trials.

(d) *Agronomic experiments*.—Trials to find out the optimum time of sowing and seed rate for growing jonna in the Tungabhadra Project area in the Hingari season have indicated that the best time to sow was the middle of September and the optimum seed rate was 12 lb. per acre. Guesarol 0.1 per cent spray has been found to be very effective against the earhead bug. These results were passed on for adoption to the project ryots.

(ii) Cumbu.

(a) *Evolution of high yielding selection of medium (90) days and short (75) days duration at Coimbatore*.—One short duration strain Co. 4 was multiplied and distributed. A few selections have been isolated for further study.

(b) *Evolution of high yielding hybrids of medium and short durations*.—Two hybrids X. 1 and X. 2 suited to both rainfed and irrigated conditions have already been established as suitable for cultivation in the southern districts. Seeds of these hybrids enough to sow about 12,000 acres mostly under irrigation have been distributed in the districts.

(c) *Evolution of high yielding strains suited to Tiruchirappalli, North Arcot and Visakhapatnam districts*.—In all 24 selections isolated from the collections of each of the tracts were under various stages of trials.

(iii) Ragi.

(a) *Evolution of short duration high yielding strains of Karunsuruttai Ragi (Coimbatore).*—Two selections E.C. 4601 and 4573 have completed trials and will be issued as strains shortly.

(b) *Evolution of strains better than K. 1.*—To evolve a strain yielding higher than K. 1 and free from lodging habit, work has been in progress at Koilpatti. Promising selections from the progenies of crosses made for the purpose were taken up for further trials.

(c) *Evolution of high yielding strains suited to central districts.*—Promising selections were taken for further study.

(d) *Evolution of high yielding strains for cultivation in the Northern and Central districts.*—Two selections superior to AKP. 2 suited to punasa (May-June) season, ten selections superior to AKP. 6 suited to Peddapanta and one selection superior to AKP. 7, suited to Pyru (December-January) were advanced to yield trials at Narasapatnam.

(iv) Tenai.

(a) *Evolution of short duration strains at Coimbatore.*—A high yielding selection maturing in 60 days from crosses made at Coimbatore was isolated and issued for trials in Nellore, Cuddapah, Kurnool and Salem districts.

(b) *Isolation of high yielding selection tolerant to rust.*—One selection was sent for trial in Cuddapah district where it recorded 25 per cent increased yield and was found tolerant to rust. Two selections were taken for further study at Coimbatore.

(c) *Isolation of high yielding strains for Tungabhadra Project area.*—In all 23 promising selections were taken for further trials.

(v) Minor millets.

Improvement of Varagu, Samai, Kudiraivali and Panivaragu selection.—Varagu Co. 1 and Panivaragu selection P.V. 14 were issued for trial in the districts. Several selections from the local collections are in various stages of trials. This work is intended to benefit an area of 20 lakhs of acres devoted to these four millets.

(c) Pulses.

Work on pulses improvement was carried on at the Central Station, Coimbatore, and the pulses sub-stations at Vizianagaram and Dharmapuri. Consequent to the merging of the pulses with the Millets section, the pulses work carried on at Dharmapuri and Vizianagaram was shifted to the Regional Millets stations at Tiruppattur and Narasapattinam with effect from 1st April 1953.

(i) *Evolution of high yielding strains of different pulses.*—Improved strains released during the year are Redgram S.A. 1, Green gram Co. 1, Bengalgram Co. 1, Bengalgram, VZM. 1, and Horsegram, VZM. 1.

During the year, nucleus seed of redgram No. 37 (S.A. 1) and of Bengalgram No. 482 (Co. 1) were also supplied to the District officers for raising seed farms. Both the strains were also multiplied at Coimbatore.

(ii) *Multiplication and distribution of seed of good quality and high yielding vegetable pulses like lablab (Avarai), cow-pea and cluster beans.*—Six high yielding and good quality types of vegetable lablab, one type of cow-pea and two types of cluster beans were multiplied at Coimbatore and seeds of the same were supplied for kitchen garden cultivation.

(d) Oil-seeds crops.

Research work on the important oil seed crops of the State, viz., groundnut, gingelly, castor and coconut was continued during the year.

(a) *Groundnut*—(1) *Production of superior strains.*—Four promising selections, viz., A.H. 6608, A.H. 6609, A.H. 6614 and A.H. 6615 have been released for trial in Chittoor and Coimbatore districts.

(2) *Hybridisation.*—The objectives of the hybridization in this crop are the following—

- (i) to evolve a dormant bunch type,
- (ii) to improve shelling out turn of T.M. V. 2, and;
- (iii) to evolve a white seeded strain.

From the progenies of crosses effected for this purpose, 56 cultures have been isolated for further study.

(3) *Evolving a type for dessert purpose.*—Seven selections made from the nine big seeded varieties in the existing collections were in various stages of trial.

(4) *Manurial experiments*—Basal dressing of cattle manure at 3 tons per acre either alone or in combination with potash (50 and 75 lb. K 20) or phosphoric acid (40 lb.) proved to be the most beneficial in the trials conducted during this year also.

(5) *Cultural experiments.*—The highest yields were obtained during the year in groundnut when six ploughings with country plough or four ploughings with mould board plough were given.

(6) *Rotation experiments.*—The results obtained once again confirmed the previous years' finding that millets following groundnut yield better than millets following millets.

(7) *Drying experiments.*—Drying moist pods of kernels at 40°C did not affect the quality and germination. Higher temperatures had adverse effects on these.

(8) *Breaking dormancy.*—Soaking kernels in 0.8 per cent ethylene chlorohydrin and in dichlorophenoxy acetic acid (50 PPM) for three hours gave normal germination.

(9) *Frequency of irrigation.*—Irrigating the groundnut crop at fifteen days interval produced the maximum return.

(b) *Gingelly.*—(1) *Production of superior strains.*—Selections made from promising varieties and progenies of crosses were under various stages of trial.

(2) *Hybridization.*—Crosses were effected between selected parents and the progenies of the earlier crosses were studied.

(3) *Spacing trials.*—A spacing of 9" × 9" for the rainfed and 1' × 1' for the irrigated was found to be most economic.

(4) *Deterioration of gingelly seeds in storage.*—Minimum deterioration was observed in glass bottles and maximum in mud pots.

(5) *Time of sowing experiment.*—Results so far obtained indicate that sowing the crop early in February was the best. The results require further confirmation.

(c) *Castor*—(1) *Production of superior strains*.—The cultures isolated from varieties and progenies of crosses were under various stages of trial. Three selections R.C. 1074, 1075 and 1076 were sent to Anantapur and Kurnool for district trials.

(2) *Hybridization*.—Four new crosses between selected parents were effected and progenies of eleven earlier crosses were studied. Twelve single plants were selected for further study.

(3) *Maintenance of inbred types horticultural types and strains*.—Nucleus seeds of the three standard strains, viz., T.M.V. 1, T.M.V. 2, T.M.V. 3 were multiplied on large scale for distribution.

(4) *Insecticidal trials against the semi looper pest*.—Dusting B.H.C. 10 per cent earlier stages and spraying DDT in the later stage have been found effective.

(d) *Coconut*—(1) *Manurial trials*.—In the manurial and cultural trials no conclusive results were obtained.

Peuraxia chaseoloides and *Calopogonium muconoides*.—Have however given good performance as cover crops in coconut plantations.

(2) *Subsidiary crops for the coconut garden*.—Pine-apple, tapioca, dry paddy, elephant yam and T.M.V. 1 strain of groundnut were grown with profit in coconut plantations.

(3) *Coconut breeding*.—The progenies of the tall $\times$ dwarf cross gave very encouraging results. A total of 1,754 nuts of the cross were harvested for production of hybrid seedlings for distribution.

(4) *Depths of planting experiment*.—From the palm characters observed so far, planting coconut seedlings at 3 feet depth was found to be beneficial.

(5) *Copra and oil studies of nuts of the Tall $\times$ Dwarf progenies*.—The quantity and quality of copra from the Tall $\times$ Dwarf hybrid compared favourably with those of West Coast tall.

(6) *Study of exotic varieties*.—Among the exotic varieties of coconut, the Laccadive ordinary, Laccadive small, Andaman ordinary, Phillippines and Cochinchina were found promising.

(7) *Study of deterioration of coconut oil in storage*.—Deterioration in the quality of coconut oil was found to be the least when the oil was boiled and stored.

(8) *Production of seedlings for distribution*.—A total of 132,273 selected seedlings were produced and distributed to growers in various parts of the State.

(9) *Miscellaneous control of rhinoceros beetle*.—Spraying the crowns of coconut trees with Guesarol 550 was found effective against the rhinoceros beetle pest and this confirms the last year's findings.

(e) *Cotton*.

Research work on cotton was carried on at the Cotton Breeding Station, Coimbatore and at the various centres all over the State.

I. *Winter Cambodia and Sea Island Cotton Scheme*—(a) *Evolution of long stapled American Cotton suited to winter tracts*.—To convert all the irrigated Cambodia crop in the districts of Tiruchirappalli, Coimbatore, Salem and Madurai into long staple category exceeding 1-1/16" staple, is the aim of this item of research. Suitable crosses of varieties collected from Barberton, Greece, Brazil, etc., with Local adaptable strains were effected.

(b) *Increasing the lint production per acre*.—In all ten cultures were isolated and taken for further trials.

(c) *Unification of the Cambodia tract*.—To evolve a strain capable of adjusting itself to the different farming systems in vogue in the winter tract, this work has been undertaken. Two cultures were found to be suitable for conditions representing early and late planting and droughty and summer zones of the Cambodia tract.

(d) *Breeding cotton for rice fallows*.—P216 F and P23 F cottons have been found to respond well in Tanjore delta while Madras Uganda 1 and 2 yielded better under Coimbatore conditions. Closer spacing and application of nitrogenous manure with early sowings were found to result in enhanced yields in rice fallows :—

(e) *Unirrigated sea island cotton in the West Coast*.—Suitable agronomic practices like transplanting seedlings raised prior to monsoon and basal dressing of manure have increased the yield of seed cotton in the Montser variety up to 80 per cent over previous yields. This cotton was adjudged to be suitable for spinning 100's fine yarn. But the mills are reported to be not designed to take up such a fine cotton. Therefore, further work is directed towards stepping down the quality and increasing the yield per acre.

(f) *Trial of perennial cottons*.—To utilize suitable perennial varieties for cultivation in waste lands, backyards, house compounds, etc., and thus increase production of cotton, a trial has been in progress at several centres. Of the several South American perennial varieties tested, Moco has been found to be hardy, productive and at the same time useful for hand spinning. Purification and multiplication of this variety is in progress.

(g) *Wild cotton study*.—To utilize desirable attributes like drought resistance, resistance to pests and diseases, etc., work for combining the desirable characters of the wild and cultivated parents had been in progress and a few promising cultures have been in the early stages of trials.

(h) *Trial of unirrigated Nadam*.—Evolution of early maturing arboreum selections suited for cultivation in the present Nadam cotton zone has yielded a promising early maturing cotton B. 32-48 and this was advanced to the district trials to determine its adaptability in the Nadam area.

(i) *Trials of unirrigated Karunganni*.—To evolve Karunganni strain superior to Karunganni 5 in ginning percent and lint quality, breeding work was undertaken. The improved selections obtained from this work were tested in scattered block trials in the districts and promising ones have been advanced for further study.

II. *Scheme for the evolution of Cambodia cotton suited to black soils under irrigated and under rainfed conditions*—(a) *Trial of irrigated American cotton for Hingari season*.—Under Tungabhadra Project. The object of this is to evolve an American variety capable of yielding not less than 1,000 lb. of seed cotton per acre under restricted black soil irrigation of Tungabhadra Project, free from fibre immaturity and neppiness and which will be able to resist jassids, thrips and blackarm and equivalent to long staple category of 1-1/6 feet. A few cultures were in the various stages of trials and promising ones were advanced for further study.

(b) *Unirrigated American cotton for the black soils of Ceded districts*.—To evolve a suitable American type for the rainfed black soils of Ceded districts to replace the existing Desi varieties is the aim of this work. Trials conducted in cultivators' holdings revealed the superiority of MA 2 and Laxmi strains over the local cotton in yield, length and ginning. Promising cultures from the family block trials were taken for further trials.

III. *Scheme for the evolution of long staple cotton suited to summer season in the Southern districts.*—(a) An early maturing American cotton possessing a staple of 1.1/8 feet or more for the summer Cambodia areas is the objective of this item of research. Trials conducted in the cultivators' holdings of the southern districts revealed the suitability of Madras Cambodia Uganda-2. A number of useful selections are under study.

(b) *Selection of a barbadense type or a hybrid derivative suitable for the coastal regions, Palur.*—To isolate a barbadense type or a derivative from their hybrids suitable for cultivation as a summer crop in the coastal regions of South Arcot district trials were conducted in 12 centres. Madras Cambodia Uganda 1 has been found to be suitable. Promising selections from progeny row trials were taken for further study.

IV. *Scheme for the improvement of Cocanadas cotton.*—(a) *Improvement of Coloured Cocanada.*—The object of this is to evolve a medium staple coloured variety of cotton superior in yield and quality to the existing strain C. 2 Cultures which were found to be either superior to C 5 or on a par with C. 2 were advanced for further trials.

(b) *Replacement of Cocanadas by white cotton.*—To isolate a suitable white arboreum type which would be adaptable for late planting is the object of this item of work. A few promising progenies in the bulk yield trials were advanced for further trials.

(c) *Chinnapathi improvement.*—To replace the short stapled, low ginning cotton variety, Anakapalli white grown in Vishakapatnam district by a medium stapled high ginning type of white or coloured cotton, a few hybrids were produced and tested under compact family and small bulk trials.

(d) *Mixed cropping.*—To find out a suitable cotton variety to be grown as a mixture with chillies which would synchronize its harvest along with chillies, five American types and five Desi types were tried as a mixture with chillies. M.A. 2 among the former and 35/6 among the latter were found profitable to be grown as a mixture with chillies, fetching an additional return of Rs. 76 and Rs. 42 per acre respectively.

This information is being passed on to the ryots through the Cotton Extension staff.

V. *Scheme for the improvement of Mungari cotton in Ceded districts.*—(a) *Unirrigated Mungari.*—To isolate an early arboreum variety of cotton with better ginning than 881F and possessing equal lint quality, is the aim of the work under way. The cultures that were found to be promising in the compact family block trials were taken up for further trials.

(b) *Trial of American varieties.*—Of the American varieties raised, Lakshmi cotton was found to be productive and early.

VI. *Scheme for the improvement of Westerns cotton.*—A number of cultures were in the various stages of trial.

VII. *Scheme for the improvement of Tinnies and Karunganni cotton.*—A large number of cultures were under various stages of trials and promising ones were advanced for further trials.

VIII. *Scheme for the improvement of Northern cotton.*—A large number of useful progenies combining vigour, halo length and ginning per cent have been selected for further trial.

IX. *Scheme for the breeding of unirrigated Cambodia cotton suited to Central and Southern districts.*—A number of selections were in the various stages of trials.

Seed supply.—The schemes for the production of nucleus seeds of strains Co. 2, M.C.U. 1 and K 5 at the Cotton Breeding Station, Coimbatore, of strains M.C.U. 1 and M.C.U. 2 and K. 2 at the Agricultural Research Station, Koilpatti, of strains W. 1 at the Agricultural Research Station, Hagari, of strain No. 14 at the Agricultural Research Station, Nandyal and of strains Cocanadas at the Agricultural Research Station, Lam, continued to function during the year under report.

(f) *Sugarcane.*

Research work on sugarcane was carried on at the Sugarcane Research Stations at Anakapalle and Gudiyattam while the results achieved at these stations were tested at the Sugarcane liaison farms located near factory areas in Samalkota, Hospet, Nellikuppam and Kulittalai. The cane research and development work is financed partly by the Indian Central Sugarcane Committee.

I. *Research—Agronomy*—(1) *Varietal study.*—About 119 varieties representing the new releases from Coimbatore were under study and the following were found promising :—

Early season—Co. 888 and Co. 887.

Mid-season—Co. 864 and Co. 859.

Late season—Co. 732 and Co. 810.

(2) *Preliminary yield trials.*—Co. 731 in the late maturing series was found promising.

(3) *Main yield trials.*—Co. 527 among the early varieties and Co. 650 among the mid season varieties were found to be superior. Co. 527 is already popular with ryots. Co. 650 has been passed on to the regional stations for trial.

(4) *Selection of varieties for swamp conditions.*—It was found that Co. 419 was superior to Co. 630 both in respect of yield and jaggery recovery.

(5) *Studies in the ripening of cane.*—In the early varieties Co. 527 gave 12 per cent recovery and for mid season Co. 449 recorded 12.5 per cent recovery in March. The possibilities of stepping up the yield of early varieties by very early planting in the season with additional dose of N. were indicated.

(6) *Study of the effects of continuous applications of ammonium sulphate to sugarcane and its rotational crops.*—The indications were that cane yields were practically similar irrespective of the type of concentrated manure which contributed to significantly higher yields than farmyard manure and no-manure treatments.

(7) *Trial of Rayungan seed material.*—The crops raised from Rayungan and top setts were practically similar to each other with regard to quality and yield.

(8) *Pit method of planting cane.*—The higher cost of production in the pit method without any increase in yields, was the indication which emerged from this trial.

(9) *Jaggery storage studies.*—Due to the monsoonic weather the loss in weight was the highest in the case of the control, i.e., jaggery were wrapped up in hessian cloth and stored, and the lowest in the case of jaggery packed with alkathene lined gunny. But the cost of packing was high in the latter method.

II. *Chemistry*—(1) *Nitrogen nutrition of sugarcane*.—The treatment receiving all the manure at 50 days after planting tended to record slightly higher commercial cane sugar percent at harvest time of Co. 419.

(2) *Foliar diagnosis studies*.—To correlate the leaf nitrogen with crop response and yield and with different doses of N and also to fix deficiency levels in leaf nitrogen, these studies have been initiated. There was no marked increase in yield beyond 100 lb. N. per acre. The sufficiency level to realize optimum yields was found to be about 2 per cent at the fourth month age. Field trials are required to confirm these indications.

(3) *Soil studies in the permanent manurial experiment*.—To study the effects of continuous application of ammonium sulphate, groundnut cake, their mixture and farmyard manurial composition, is the aim of this investigation. There was a lowering of exchangeable calcium in the soil when ammonium sulphate alone was applied as manure. It is too early to find the marked effects on soil composition as a result of the permanent manurial treatments.

(4) *Composting of cane trash*.—Pigdung at 20 per cent level was most efficient of all the treatments tried. The compost in this case was ready not only earlier but was also found to be richer in N and P_2O_5 contents.

(5) (a) *Chemical composition of juice and jaggery quality*.—The juice from deteriorated canes was more acidic and contained less of phosphates and more of glucose than that from the immature canes. Definite PH levels for liming to secure good quality jaggery have been arrived at in the case of immature, mature and deteriorated conditions of cane.

(b) *Studies on lime and superphosphate as clarificants in the manufacture of jaggery*.—Liming of juice up to PH 6.4 for immature canes and up to 6.9 for mature canes was found to give jaggery of good colour and hardness. Super phosphate was found to be useful in jaggery making only under immature and mature conditions of cane.

III. *Physiology*—(1) *Water requirements of sugarcane in relation to manuring*.—The C.C.S. per acre was more in plots receiving irrigation once in 12 days. Plots manured with groundnut cake and mixture, recorded slightly higher C.C.S. per cent than plots that received ammonium sulphate only as manure under irrigations once in 12 days treatment. This item of research is aimed to determine the water requirement of cane and the influence of irrigation-cum-manurial treatments on yield and quality.

(2) *Water requirements of the first ratoon crop in relation to the form of manure*.—The difference in yield between irrigation once in 12 days and irrigation once in 24 days was not significant. Plots manured with ammonium sulphate recorded the highest yields. Under longer interval irrigation (once in 24 days) plots manured with cake only recorded the highest sucrose per cent.

(3) *Studies in the ripening of cane*.—Canes planted in March and May tended to improve with age and the peak sucrose level was lower in the May planted crop. The possibility of controlling maturity of Co. 419 by cultural practices was indicated.

(4) *Studies on Weedicides*.—Spraying of Pernoxone plus diesel oil soap emulsion was found to be effective against weeds like *Trianthema decandra* and even nut grass.

(5) *Studies on propping*.—Planting in trenches one foot deep and five links apart, propping by the trash twist method and good earthing up were found effective in protecting a moderate crop against high winds.

IV. *Mycology*—(1) *Smut resistance studies*.—Among the varieties tried Co. 729 and Co. 744 showed little infection.

(2) *Experiment on carry over of smut*.—Smuted stubbles have been found to give rise to maximum percentage of infection and hence ratooning beyond the first year is not recommended.

(3) *Study of loss in yield due to smut*.—The extent of loss has been found to vary with the incidence of the disease under field conditions. The average loss went up to 55.5 per cent in plant crop and 51 per cent in ratoon as compared with a healthy crop.

V. *Entomology*—*Chemical control of borers*.—The trials indicated that spraying with chemicals in the early stages of crop growth checked the early shoot borer and a loss of 4.54 tons per acre can be saved by spraying with .32 per cent DDT.

VI. *Liaison Farms*.—Regional trial of varieties that pass through preliminary observations at Anakapalle and Gudiyattam constituted an important item of work for the liaison farms.

That the cost of cultivation of cane can considerably be reduced by planting in deep trenches, banking high and propping by trash twists were demonstrated at Sugarcane Liaison Farm, Samalkot. That the poor quality of cane in the Pugalur tract is mainly due to harvest of immature cane and lack of varietal and planting schedules were confirmed by the results of trials at the Sugarcane Liaison Farm, Kulittalai. Better yields and recovery through Adsali crop of Co. 527 were recorded at Nellikuppam.

The findings of cane research were passed on to the growers through the cane development staff.

(g) *Fruits*.

Research work in fruits was in progress at the Fruit Stations at Kodur, Coonoor, Kallar and Burliar and College Orchards, Coimbatore. Besides the Model Orchards-cum-Nurseries scheme was working at the following centres:—Peddapuram, Periyakulam, Mangalore, Thimmapuram and Giddalur. The Cashew Research Station at Mangalore was newly put into operation towards the close of the fasli year. In addition small orchard areas are set apart in the Agricultural Research Station, Anakapalle, Lam, Taliparamba, Araku and Wynaad. Banana research was in progress mainly at the research station at Aduthurai.

I. *Mango (Kodur)*—(1) *Shoot growth studies in relation to the yields*.—Annual growth in Bangalora appeared to be more than in Neelam and extended over a longer period. No definite cycle growth tendency appeared to exist in both these varieties. A higher percentage of laterals than leader shoots produced flowers. These studies at Kodur are intended to secure an idea to enable growth regulation in each variety so as to secure good fruit yields.

(2) *Hybridisation in mango*.—Over 8,000 crosses were made at Kodur during the year. So far 20 promising hybrids have been isolated and these constitute a welcome addition to our mango wealth. Grafts of these promising hybrids are greatly in demand both in this and outside the State.

(3) *Isolation of clonal strains*.—Fruits borne in the interior portions of the tree were found to be bigger, and better in fruit quality in three varieties of mangoes under study. This is an incidental observation made while searching for superior clonal strains at Kodur.

II. *Citrus* (Kodur)—(1) *Variety testing*.—In all, twenty varieties at Kodur, eight at Araku and one at Coonoor were adjudged as most promising. Plants of all promising varieties have been propagated and distributed to growers in different parts of the State.

(2) *Root stock trials*.—An analysis of the yield data recorded over a period of ten years from bearing shows that trees on Gajanimma, acid lime, Kichili and Jamberi were leading over the rest. In respect of fruit quality Sathugudi on Sathugudi stock gave the best quality fruits. Plant supplies are now being made on the root stocks found promising at Kodur.

(3) *Exploitation of bud sports*.—Three tree selections in Sathugudi reputed for heavy off-season bearing and one of local Kamala orange (Mandarin) were propagated for study.

(4) *Citrus hybridisation*.—The seedlings raised in the inter-varietal crosses of sweet orange and lemon were under observation. Further selfing and crossing were done.

(5) *Survey of orchards in Krishna district with a view to study the behaviour of Batavian acid lime and Vadlapudi trees raised on different root stocks in the tract*.—The performance of Sathugudi Batavian and acid lime on sour orange appears to be uniformly more satisfactory than on others.

III. *Apple* (Coonoor)—(1) *Varietal studies*.—The eight varieties isolated previously as promising were multiplied and grafts of these supplied to the cultivators.

(2) *Root stock trials*.—The data collected so far has suggested that Merton 779 and 778 are superior to the other stocks from the point of view of vigour and fruit yield.

(3) *Cultural trials*.—The trees sprayed with Sandolin "A" and linseed oil emulsion broke dormancy 23 and 15 days earlier than the control and bore 375 and 230 fruits as against 160 fruits of the control, thereby indicating the efficacy of such sprays.

IV. *Plums* (Coonoor)—(1) *Varietal studies*.—On the basis of the previous years' trials ten varieties of plums found promising are being multiplied and supplied to cultivators.

(2) *Root stock trial*.—The common peach continued to impart the maximum vigour to the scions. The stock-scion incompatibility is getting accentuated on all the plum seedling stocks.

(3) *Pruning trials*.—The results were once again in favour of "Long" pruning in the three plum varieties, Gaviota, Hale and Alu Bokhara.

(4) *Top working trials*.—The polliniser influence of Hale and Kotagiri on Shiro and Abundance has been established. The top-worked shoots of Kotagiri on both the varieties made good extension growth.

V. *Peach* (Coonoor)—(1) *Varietal studies*.—On the basis of the previous year's studies, four promising varieties were multiplied for distribution to ryots.

(2) *Trials with root stocks of varying ages*.—Results so far obtained showed that trees on eight months old stocks were found to be more vigorous and precocious than on 20 and 32 months old stocks.

(3) *Pruning trials*.—Data gathered during the year once again confirmed the superiority of long pruning method in Killikrankie.

VI. *Pear* (Coonoor)—*Varietal studies*.—Introductions made from Kodai-kanal and New Zealand were under observation. Kieffer was adjudged as a promising variety.

VII. *Other crops* (Coonoor).—In the trials to assess the comparative merits of cherimoyar seedlings versus grafts the grafts were leading the seedlings in stem girth and tree height.

In strawberry a positive correlation was worked out between the yields of individual plants and their clonal progenies. Multiplication of high yielding types was under way both at Coonoor and Nanjanad.

Vegetative propagation by rooting of cuttings was found to be a very useful and simple method in tree tomato.

VIII. *Mandarin orange* (Kallar)—(1) *Root stock trial*.—Plants on Jamberi continued to be vigorous. Similar trials at Wynaad showed rough lemon and marmalade orange as promise for mandarin.

(2) *Hybridisation*.—In all 30 more inter-specific crosses were effected and the hybrid seedling progenies were under observation.

IX. *Mangosteen* (Kallar).—Progeny trial to study the performance of seedling progenies of individual parent trees selected for yield, gamboge resistance, etc., was in progress. The seedling progenies were just establishing.

X. *Anonas* (Kallar)—(1) *Root stock trial*.—The performance of custard apple and cherimoyer on bull's heart stock continued to be superior to that on other root-stocks.

(2) *Hybridisation*.—Hybrid progenies of three parental combinations were under study.

XI. *Pine Apple* (Kallar)—(1) *Hybridisation*.—Crosses were effected making use of 660 flowers of two varieties—Mauritius and Kew and the crossed fruits were developing.

(2) *Hormone trial*.—To determine the effect of the application of hormone for extending the bearing season is the aim of this study.

Application of planofix in concentration of 0.001 to 0.003 per cent promoted earliness in fruiting by a month or 1½ months. Similar results were obtained at Taliparamba with concentrations of 0.01 to 0.1 per cent.

XII. *Jack and Bread fruit*—(1) *Hybridisation*—(Coimbatore).—Hand pollination of bread fruit with its own or jack pollen was found to increase fruit size and weight.

(2) *Root stock trials*.—At Kallar the trees were under observation and those on Rudrakshi stock continued to lead the rest in growth.

Bread fruit (Burliar)—*Propagation trial*.—Inarching on the seedlings of the seeded variety as a method of vegetative propagation does not appear to be promising.

XIII. *Durian* (Burliar)—*Propagation trial*.—Cent per cent success by inarching on its own seedlings stock was recorded.

XIV. *Sapota Hybridisation* (Coimbatore).—The hybrid progenies obtained from Cricket Ball Xoval were under observation.

XV. *Papaya* (Coimbatore).—Purification has resulted in uniformity in Ranchi type which is thus fit for being released. Further purification in other types is in progress.

XVI. *Vegetables*.—Brinjals and Bhendai (Coimbatore)—Field testing of the selfed material and the hybrid material was in progress.

Seed multiplication of determinate types of canadian tomatoes was in progress.

(h) *Bananas.*

Research in banana is carried on mainly at the Central Banana Research Station, Aduthurai, which is financed jointly by the State Government and Indian Council of Agricultural Research.

Research—(1) Varietal collection.—About 150 banana varieties collected from different parts of Indian Union and outside were under study. Bunch weight of 20 lb. each and over were recorded in sixteen varieties. In all 5,176 suckers of 84 varieties were sold to the public.

(2) *Manurial trial in wet lands.*—The results show that the best manurial treatment is that in which 1/4 lb. N is applied as cattle manure (50 lb. cattle manure) and 1/4 lb. as ammonium sulphate (1 lb. 4 oz.) in two doses, the first three months after planting and the second five months after planting in addition to a basal dressing of 25 lb. cattle manure per plant. The substitution of groundnut cake to supply 1/4 lb. N either to replace cattle manure or ammonium sulphate has given the next best result. There has been no response to the addition of potash or phosphoric acid for the heavy clay wet land soils of Aduthurai, which are typical of the Tanjore delta.

The banana station was subject to cyclone in November 1952 which caused heavy damage. All the trials had therefore to be relaid.

(3) (a) *Bananas (Kallar)—Hybridisation.*—To breed new economic types of banana by combining in a few forms all the desirable qualities now dispersed in several varieties.

Three inter-specific crosses involving sixteen parental combinations were effected. This resulted in the production of 45 seeds which were sown for further study.

(b) *Banana—Hybridisation (Coimbatore).*—To combine the various desirable characters now found dispersed in the several cultivated varieties a large number of inter-specific crosses were made which were under observation.

(i) *Pepper.*

Research on pepper was carried on at the Agricultural Research Station, Taliparamba, and at the Pepper Research Station, Panniyur, which is financed jointly by the State and Indian Council of Agricultural Research.

(1) *Variety collection.*—Cuttings of 28 varieties and types of pepper from Malabar, Travancore, North Kanara, Assam and Ceylon were planted out to establish a varietal collection of pepper. Three types of Kalluvally (one hermaphrodite type, two female types), two types of Balankotta, one pure male vine of Kottanadan of Travancore and one wild species of *Piper Attenuatum* were located in different localities.

(2) *Hybridisation—Preliminary studies.*—From an observational trial to find out whether pepper vines can be induced to flower earlier than usual by watering, it was found that vines pot-watered copiously in March developed spikes by May. The findings will be useful for future hybridisation work by forcing the spikes to develop on the dry season, instead of during the monsoon season, when the work of controlled pollination will be greatly hampered and vitiated by the heavy almost incessant rains.

(3) *Selection of pollu resistant vines.*—The sixteen vines which exhibited pronounced tolerance to pollu in the previous years were selected for further observation for two more years.

(4) *Studies on pollu incidence.*—It was found that pollu can be controlled by regulating shade. The incidence was very severe under dense shade, whereas it was comparatively slight in open situations. The disease manifested itself in September, it was also found that the disease was endemic in certain localities and was slight or absent in some other localities.

(5) *Selection of wilt resistant vines.*—The vines selected in Wynaad for wilt resistance in January 1952 were examined in February 1953 and promising ones retained for further observation.

(6) *Study of the incidence of wilt in relation to soil aspect and cultivation practices.*—Wilt has been found to be a major problem only in localities away from the coast in hilly tracts. Wilt was also found associated with any one or more of the undermentioned causes.

(a) Low soil depth and presence of a large amount of disintegrated granite rock.

(b) Water stagnation for long periods in the year.

(c) Severe exposure to the afternoon sun, particularly in summer.

(d) Poor soil fertility and lack of humus.

(e) Severe soil erosion resulting in exposure of the base and roots of vines.

(7) *Varietal susceptibility to wilt.*—Uthirankotta and the wild species *Piper Attenuatum* have been found to be almost resistant to the disease. Grafts on these have already been raised for planting in sites where wilt is endemic.

(8) *Propagation studies.*—Trials on inarching the cultivated varieties to Uthirankotta and *Piper Attenuatum* rooted cuttings were initiated and it has been proved that such grafting was easy and that a graft could be obtained within 75 days, by inarching.

Layering trials have established that the younger nodes develop roots more quickly than older nodes and that layering can be done successfully in all the months from October to February.

Trial with four different media for rooting pepper cuttings has shown that ordinary gravelly soil is the excellent medium.

Trials on seedling propagation have shown that the seed of cultivated pepper varieties are viable and that the seeds germinated quicker if sown without seed coat than with seed coat.

(j) *Cardamom.*

Research in cardamom was continued in the Plantations of Messrs. Bombay Burma Trading Corporation, Limited, on the Singampatti hills in the Tirunelveli district under a research scheme financed by the Indian Council of Agricultural Research and State Government.

(a) *Botanical.*—Studies on the rate of growth of aerial shoots, panicles, panicle habit, shape of capsules, etc., were continued.

(b) *Survey and collection.*—The Lower Palnis in the Madurai district, the Anamalais in the Coimbatore district, the Sivagiri, Kannikatti and Kattalimalai in Tirunelveli district and the cardamom hills in Travancore were surveyed. Seeds of six types of cardamom were collected and sown in the nursery.

(c) *Hybridisation.*—In all 266 crosses were made for combining desirable characters in the off-springs.

(d) *Agronomic.*—In the field trials of Singampatti selections two selections gave markedly increased yields over the control.

In the varietal trial two Bodinayakanur varieties gave significantly higher yields than the control.

(e) *Entomological*.—Autoxone 1 : 500 was found to be the best followed by gammexane for the control of thrips.

(f) *Pathological*.—It was found that fumigation with formalin did not in any way affect germination adversely.

(k) *Chillies*.

Research work on chillies was carried on at the Agricultural Research Station, Lam, Guntur. This work is also financed jointly by the Indian Council of Agricultural Research and State Government.

(1) *Field trials*.—The trial on cultivators holdings with G1 and 1402 was repeated during the year. The yield data from seventeen centres revealed the superiority of the strain over the local. G1-222, a reselection for G1 was found to be the best of the cultures tested during the year at the Station. The selection 1,402 maintained its superiority over the others, while out of 231 cultures analysed for yield data five cultures gave 30 to 40 per cent more yield than 1,402 at the Station.

(2) *Collections*.—In all 143 varietal bulks from India and abroad were studied in observation plots. All the exotic types were found to be low yielding and unsuitable. Some of the American types which developed bright red colour were made use of for hybridising towards colour development.

(3) *New crosses*.—In all, 1,429 crosses were effected with 49 combinations and the material was collected for further study.

4. *Agronomic*.—In the insecticidal experiment, the three years, results revealed, that P. 520 (B.H.C. 50 per cent) spraying gave an effective control over thrips. In seasons of mild attack, D. 025 (B.H.C. 50 per cent) dusting with rotary duster has been found to be economical.

Coriander—Coriander improvement.—To evolve a high quality strain of coriander for distribution in the coriander areas of the Central and Southern districts. Trials were conducted with the strains already collected.

The old strain 731 continued to maintain its superiority.

8. SYSTEMATIC BOTANY.

Systematic botany—(1) *Survey*.—The survey conducted in Anamalais resulted in finding out a suitable fodder *cum* cover, viz., *Indigofera endecaphylla*.

(2) *Acclimatisation trials*.—“Blow buffel” a grass from Bangalore was found to be good drought resistant, and showed high capacities of regeneration. A few grasses tried in Nanjanad (Nilgiris) indicated also frost resistant qualities.

The best performers among all grasses tried were multiplied and supplied to ryots.

Calapogonium mucunoides and *kudzu* were found to be suited for heavy rainfall areas like the West-Coast. These cover crops are already under cultivation in several rubber estates. Seeds of these were distributed to all the districts for multiplication.

In all eighteen species of *Crotolaria* were tried for green manure crops. *Stizolobium alterimum* (Velvet Beans) has shown to be a very promising cover crop with rapidly spreading abilities.

Cassia hirsuta was found good for rainfed areas.

The manurial trial with Vettiver grass was concluded and analysis of oil was being done. *Ocimum camchoru* has been found to do well in Shevroys, Anamalais and Wynaad.

(3) *Germination studies*.—The dormancy and viability of seeds of four important grasses were studied. *Cenchrus ciliaris* gave 28 per cent germination in the second year as contrasted with 4 per cent obtained immediately after harvest.

Cenchrus Setigerus which showed no germination in the first few months gave 2 per cent during second year of storage. The results of these trials will be utilized when despatching seeds to ryots to indicate the period when it will show high germination.

(4) *Herbarium*.—The total number of specimens identified during the year came to 1,222. During the year, 1,400 specimens were incorporated in the Herbarium and 550 specimens were found to be new distributions for different districts. The Botany Department of the Jerusalem University presented to the Herbarium 100 specimens which are valuable additions to us.

9. BOTANIC GARDENS AND PARKS.

1. *Coimbatore*.—Multiplication of ornamental plants for augmenting the receipts of the garden has been the main item of work. Trials on forcing the growth of avenue tree seedlings in nursery stage were in progress. Facilities were provided as usual for teaching for B.Sc., (Ag.) and Horticultural diploma course students in ornamental gardening.

2. *Bapatla*.—The garden was extended and a large number of ornamental, medicinal, economic and other miscellaneous plants were introduced.

3. *Ootacamund*.—Introduction of exotic and indigenous types of ornamental, and economic plants was continued. Noteworthy among them were three species of *Eucalyptus* from Dehra Dun, two species of *Liliums* and three species of *Cyclamen* from the United Kingdom. Studies on the vegetative propagation of *Magnolia grandiflora*, *Quereus* and *Wistaria*, and observations on the viability of seeds of three species of trees were continued. The work on extraction of essential oil was continued and oil of *Cymbopogon mardus* and *Eucalyptus* from as many as 30 different species was extracted.

4. *Sim's Park, Coonoor*.—Observations on the growth, flowering and performance of annuals, shrubs and trees were continued to be recorded with a view to enable the planning of gardens with maximum effect for different seasons.

10. CYTOGENETICS.

I. *Sorghum*.—To have an exact knowledge with regard to the crossability, affinity and chances of success of wide crosses in the breeding programme and to combine the desirable characters of the wild species in the cultivated ones, a collection of species related to cultivated sorghum has been made. In *S. Halapense*, twenty chromosomed forms were collected. Only 2-40 forms of the species had been known before. An interspecific hybrid between *S. Halapense* and Co.1 was obtained. An F. 2 progeny was raised.

II. *Pennisetum*.—Study of the inter relationship between the different species in order to produce new types by colchicine treatment, hybridization and selection and also to evolve rust resistant types is the object of the research under this heading. Back crossing of the allotetraploids of the cross cumbu and Napier grass was done. With the increase of chromosomes of the cultivated cumbu plant, the susceptibility to rust has been found to be increased. The fourth generation population of the tetraploid and cumbu showed greater variability as regards drought resistance, perennial habit and high degree of rust resistance.

III. *Setaria*.—A collection of wild species of setaria has been made for the production of interspecific hybrids for ultimately evolving rust resistant plants.

IV. *Fruits*.—Induction of polyploidy and isolation of triploids in Sathugudi orange is the aim of Research on fruits, as a means of producing ultimately new types of orange which is better in yield, quality and seedlessness. Twin seedlings in Sathugudi were isolated and examined. No triploids were met with so far. Treatment with colchicine has reduced marked effects.

V. *Study of wild rice*.—To assess the breeding value of the various races in rice, including wild species, this study has been taken up. From various sources, 12 wild varieties were collected and grown at Coimbatore. Interesting features such as subterranean stems, prostrate habit and semi-sterility were noted and studied.

The crosses made in previous years between types from different countries were grown and studied in detail. Single plant selections were made for economic characters. Some of these selections have shown homozygosity (purity) for external characters.

VI. *Interspecific hybridization in rice*.—In all, four successful interspecific hybrids were secured for further study.

VII. *Induction of genetic and chromosomal variations in rice*.—With the aid of Colchicine 14 tetraploids have been produced. The seed fertility has been found to vary from plant to plant. The diploid progenies of auto triploid in T. 1756 (G.E.B. 24) (*Oryzaperennis*) has given promising selections.

11. AGRICULTURAL ENGINEERING.

1. *Mechanised operations*.—John Deere Peanut Planter was tried further for sowing groundnut, with a view to reduce the spacing between rows to approximate to Indian practice as much as possible. It was not possible to get the 6 to 9-inch spacing between rows as is practised locally.

The John Deere Peanut Harvester was also tried further. With dead weights of 2,000 lb. each, the harvester blades uprooted the groundnut plants successfully. There is a gap of about 1' 6" between the blades which allows some plants unharvested as the spacing between rows is closer in local practice than that for which the implement is designed. Hence a guntaka was attached behind the tractor to tackle the unharvested plants. The working was satisfactory.

The John Deere Rake was also tried further for collecting the harvested groundnut plants. It did very well in heaping up the harvested plants. By the attachment of a guntaka, both harvesting and heaping up the plants can be done simultaneously thus saving time and labour.

2. *Studies on mechanization of operations on paddy lands*.—The Howards' Rotavator, when tried further, was found to do all the three operations, viz., cutting the green manure crop to pieces, puddling the soil and incorporating the green manure, very satisfactorily. The Gem's Rotary hoe was tried successfully for puddling operations. This is quite handy and useful for medium landholders. It was tried in wet lands and was found suitable for pulverising the soil. The only drawback was that the engine is stalled by the entrance of water in the exhaust pipe where the water inundation is more.

Implements in use in Japan were also tried. The Rotavator hoe and hand paw were found to eradicate the weeds satisfactorily when the paddy seedlings are planted in perfectly straight lines with 9" spacing between rows. These can also be used to puddle and cultivate small holdings.

A pedal operated paddy thresher fabricated on the model of the Japanese type was found to be satisfactory.

3. *Studies on combine operation*.—The combine harvester unit was found to be satisfactory on the crops, though it was not a complete success on cholam and cambu crops.

4. *Hitching Indian implements behind the tractor*.—Two mechanical seed drills were combined into a single unit and rendered suitable to be hitched behind the tractor. The drill could sow through 22 tynes arranged in two rows one behind the other. Confirmatory tests are yet to be made.

5. *Manufacture of spares*.—The following are among those manufactured now :—

Lining pipes, needle valve, baffle valve for vacuum pump, circulation coils, funnels and measuring cans, decompression lever sets, boring chisels and augers, exhaust flanges, drum pulleys, shovel funnels, mobile block for power pulleys, lock nuts and adjusting studs for lubrication pump, pipe lamps and shoes, airvent cock for filters, cylinder head studs, centre shaft for water pumps, wedges, turning lorry crank shafts, shim plates, corner blades, valve cutters, handles, depth adjustment screws, master pins and washers, brass bushings, water drum plugs, steel bushings, valve seats, centre blades for bull dozers, fuel adjustment needle valve for carburettor and pipe unions.

6. *Miscellaneous*.—(a) Trials on the "Zuiko" paddy shelling machine revealed the suitability of this machine for threshing paddy.

(b) Trials on "Zeter" tractor showed that about an acre could be covered in one hour attaining a depth of 6 to 7" in black cotton soils. The diesel oil consumed was 1½ gallons per hour. Being a light tractor, with a short turning circle (3' radius), it is quite suitable for small farms also.

(c) The Bose Plough manufactured at Melur in Madurai district was tried. The construction of this plough is very simple and the draft required is low. A depth of 2" in heavy soils and 3 to 4" in loams has been obtained. It is a definite improvement over the country plough and compares very well with the mould Board plough.

(d) The seed boxes, similar to the groundnut seed box, received from the Indian Council of Agricultural Research were tried on a small area for sowing groundnut. The results were satisfactory. The implement is drawn by a pair of bullocks and sows in three rows. This arrangement is superior to the one obtained by mounting a single seed box on a country plough drawn by a pair of bullocks when only one row is sown at a time and when the weight of the seed drill weighs down the operator every time the plough slants to a side.

12. AGRO-INDUSTRIES.

1. *The Malt Factory Coimbatore.*—This factory was started in 1942 as a Government Industrial enterprise. In view of the non-availability of cholam seeds at economic prices and the absence of an easy market for factory's products in competition with lower priced foreign products, Government in G.O. Ms. No. 1932, Agriculture, dated 13th December 1952, ordered the closure of the factory and the disposal of the machinery and stocks. The factory was closed down on 31st January 1953.

2. *Fruit and vegetable canning and preservation*—I. *Canning trial.*—Trials were continued in the canning of mango slices, mango pulp and palmyra kernels. Neelum and Baneshan, canned in bulk lots, showed good keeping quality. Khader and Alfonso mangoes yielded satisfactory canned products. Modified 'Packs' of canned palmyra kernels, muskmelon pulp and potatoes and other vegetables proved satisfactory both in respect of storage and edible qualities.

II. *Juices, squashes, cordials and syrups.*—Four kinds of fruit juice cocktails and two of mixed squashes were prepared. The compositions and blends tried were satisfactory. Simple recipes were evolved in each case. Chinese orange juice was canned by a simpler, quicker method of heat sterilization with encouraging results. The canned juice proved satisfactory for preparing squash during the off-season.

III. *Jams, jellies and marmalades.*—A jelly of superior quality was obtained from cheap and abundantly available wild figs. They also proved useful in improving the set of roselle jelly. Mango jelly prepared from green seedling mangoes showed some promise. A cheap, yet satisfactory, marmalade was produced by blending Chinese oranges with 'Vadlapudi' and 'Marmalade' oranges. The residue other than peel, left over after the extraction of juice from Chinese oranges, was utilized in preparing a marmalade, in no way inferior to the standard article.

IV. *Candying of fruits and vegetables.*—A candy of satisfactory quality was produced from palmyra kernels. Trials on artificial colouring of candied kernels to an attractive ruby red shade and of making a preserve of the kernels in passion fruit syrup indicated promise.

V. *Fruit products unit.*—The citrus juice unit and other items of machinery purchased in the United Kingdom were received during the year. Installation of the overhead water storage tank and steam boiler was completed. Steps were taken to speed up the purchase and installation of an electricity generator and electric motor pump set as also the electrification of the fruit products unit.

APPENDIX.

List of strains released during the year 1952-53.

PADDY.

Serial number and Strain number.	Name.	Particulars.	Date of release.
(1)	(2)	(3)	(4)
1. TKM. 6 ..	Sanna Swarnavari ..	For Navarai and Swarnavari in Chingleput district and North Arcot district.	16th January 1953.
2. MTU. 22 ..	Pedda kusuma ..	For Guntur and Krishna districts.	Do.
3. ADT. 25 ..	Blast resistant white sirumani.	To replace ADT. 2 which is susceptible to blast in Tanjore district.	12th December 1952.
4. PTB. 31 ..	Elapapoochamban ..	For Palghat taluk and Malabar district.	25th November 1952.
5. PTB. 32 ..	Aruvakari ..	For Walluvanad taluk of Malabar district.	Do.
6. MGL. 2 ..	Red kayama ..	For South Kanara district and Northern parts of Malabar district.	Do.

PULSES.

Strain number.	Particulars.	Date of release.
(1)	(2)	(3)
Redgram SA. 1 ..	A selection from local variety of Tirupatur taluk in North Arcot district. It is suitable for cultivation in all the southern districts of the State. Duration 5½ months. Yield about 800 lb. grain per acre as pure crop.	Released in May 1953.
Greengram Co. 1 ..	A selection from local variety of Coimbatore district. It is suitable for cultivation on dry land in the Southern districts of the State both in the South-West and North-East Monsoon seasons. Duration 4½ months. Yield about 400 lb. grain per acre as pure crop.	Do.
Bengalgram Co. 1 ..	A selection from local variety of Coimbatore. Suitable for cultivation in Ceded districts and Coimbatore. Duration 3½ months. Yield about 600 lb. grain per acre as pure crop.	Do.
Blackgram VZM. 1 ..	A selection from local variety of Visakhapatnam district. It is suitable for cultivation on dry land in Northern Coastal districts of the State. Duration 3 months. Yield about 350 lb. of grain per acre as pure crop.	Do.
Horsegram VZM. 1 ..	A selection from local black seeded variety of Visakhapatnam district. Suitable for cultivation in Srikakulam and Visakhapatnam districts. Duration 4½ months. Yield about 500 lb. of grain per acre as pure crop.	Do.

13. AGRICULTURAL RESEARCH STATIONS (REVIEW OF WORK).

(1) *Agricultural Research Station, Aduthurai (Tanjore district).*

A. General.

During the year new records of paddy production and seed distribution, viz., 233,092 lb. and 208,842 lb. respectively were touched on this station. A total number of 333,000 seedlings of sesbania were distributed to ryots. Cuttings totalling 23,500 and seedlings totalling 6,275 of green leaf yielding trees were sold to the public for propagation. The successful sinking of three more filter points helped to solve the problem of adequately irrigating the large area under cotton during the summer months. The requisite kuruvai seedlings for 1953-54 could also be raised in advance of the receipt of canal water with the help of the filter point tube wells.

B. Results achieved during 1952-53 crops.

Paddy—(1) *Introduction*.—Ten short duration Chinese varieties supplied by the Director of the Central Rice Research Institute, Cuttack, were compared for the first time against the local kuruvai varieties and four of them were found to be promising, not only in respect of their performances on the balance but also their non-lodging habit.

(2) *Pure line selection*.—Culture No. 10600, isolated from poonsamba, a popular variety cultivated under rainfed tanks in Tiruchirappalli district, was released as ADT. 24 after the requisite yield tests both on this station and on ryots' fields in the preceding years.

(3) *Hybridization*.—Culture No. 1560 (across between Co. 4 and ADT. 2) was released as a "blast" resistant white sirumani like strain, namely, ADT. 25. This is bound to replace ADT. 1 and ADT. 2 (red and white sirumani, respectively) in Tanjore delta in due course.

(4) *Manurial experiments—Organic matter requirement of the soil*.—A uniform application of ammonium sulphate to all the treatments including the "control" at a liberal dose of 45 lb. N per acre masked the responses of the organic manures to a considerable extent, but comparatively green leaf proved to be superior to both cattle manure and farm-waste compost.

(5) *Nutrient requirement of paddy*.—In this experiment where only the two common chemical manures, namely, ammonium sulphate and super phosphate are applied at different levels of N and P_2O_5 without any combination of organic manures, ammonium sulphate at 45 lb. N per acre has given the best results, whereas super-phosphate, though applied by placement, has not shown adequate response.

(6) *Permanent manurial experiment*.—This is designed to find out the manurial effects of green leaf, cattle manure, farm-waste compost and ammonium sulphate at 60 lb. N per acre when applied alone and in combination with other manurial ingredients, namely, phosphate, potash and lime. Both green leaf and ammonium sulphate have recorded distinctly higher yields than cattle manure and farm-waste compost. None of the other inorganic manures mentioned above have, however, shown any perceptible response.

(7) *"Udu" experiment*.—This was intended to determine the optimum ratio of kuruvai—Ottadan seed mixture and also to work out the economics of manuring the Ottadan crop after the harvest of the kuruvai component. The seed ratio of 3:1 of kuruvai:ottadan gave the highest yield and it was found to be profitable to manure the Ottadan crop with ammonium sulphate supplied as top dressing at 45 lb. N per acre.

(8) *Cotton on rice fallow*.—A total area of 17 acres was cultivated with this crop. Due to the late sowing of the crop under unavoidable seasonal conditions, the average yield worked out only at 610 lb. of kapas per acre.

(9) *Coconut*.—A total number of 9,253 nuts was obtained and sold.

(10) *Green manure crops*.—The useful practice of growing *Sesbania speciosa* on the field margins of kuruvai crops and incorporating it for the succeeding thaladi crops was adopted on the entire double crop area of this station. An inter-sown crop of this green manure raised on the whole six-acre block of samba rice fallow in H block yielded an average of about 60,000 lb. of green matter per acre.

C. Programme of work for 1953-54.

1. *Seed Multiplication* of Aduthurai strains and a few other special varieties of paddy that are in popular demand in Tanjore and other adjoining districts.

2. *Improvement by pure line selections*.—Replicated yield tests of the promising cultures of (a) the three rain fed varieties of Arantangi taluk, namely Kattaivellai, Kodaivellai and Kaivarisamba, (b) Mattaikuruvai, a red-riced kuruvai variety of Tanjore and South Arcot districts, (c) Thiruthuraipoondy kar, a short duration flood resistant variety and (d) Kattuvanam, a long duration flood resistant variety.

3. *Improvement by Hybridisation*.—The progenies of a number of crosses effected for the following main purposes will be studied and desirable selections carried forward:—(a) to evolve saline resistant strains of short, medium and long duration possessing good rice quality, (b) to induce seed dormancy in short duration varieties, (c) to evolve "blast" resistant varieties of different durations possessing superior rice quality and (d) to evolve high-yielding strains with stiff straw in order to prevent premature lodging.

4. *Improvement by Introduction*.—(i) Yield tests of Aduthurai strains with other outstation strains will be continued. (ii) Ten short duration Chinese varieties received from the Director, Central Rice Institute, Cuttack, will be under replicated yield tests against the local kuruvai varieties for the second year.

5. *Manurial experiments*.—(1) Co-ordinated set of manurial experiments (second year)—

(a) Organic matter requirements of soil.

(b) Nutrient requirements of paddy.

(c) Permanent manurial experiment.

(d) Application of superphosphate directly to the paddy crop and indirectly to the preceding green manure crop.

(2) Application of the green manure "*Sesbania speciosa*" as green versus air dried and stacked (first year).

(3) Time of planting-cum-manurial experiment (first year).

6. *Cultural experiments*—

(a) "Udu" trials—optimum ratio of kuruvai; ottadan seed-cum-manuring ottadan.

(b) Optimum age of seedlings at transplantation in kuruvai, samba and thaladi.

(c) Japanese versus the usual farm method.

7. *Plant protection*.—(a) Insecticidal trials in collaboration with the Agricultural Entomologist, Coimbatore, for control of paddy "stem borer" and "soorai" (mealy bug). (b) Disease bombardment test of "blast" resistant cultures in collaboration with the Paddy Specialist and Government Mycologist, Coimbatore.

8. *All-India co-ordinated crop weather scheme*.—A critical study of the paddy crop in relation to the prevailing meteorological factors.

Other items of work would include the cultivation of cotton on rice fallow, growing of green manure crops for leaf and seed, production of vegetable seeds and seedlings for sale to the public, propagation of seedlings and rooted cuttings of popular fruit plants, maintenances of a Sindhi herd for demonstration and for stud, rearing or Rhode Island Red breed of poultry for supply of hatch eggs and chicks to the public and apiculture and pisciculture for demonstration.

(2) Central Banana Research Station, Aduthurai (Tanjore district).

A. General.

The cyclone which swept over the district during November 1952 caused much havoc and the field trials in progress were vitiated, rendering it necessary to relay all the trials.

B. Results achieved during 1952-53.

1. *Banana varietal collections*.—The up to date varietal collections at the station numbered 150.

Sixteen varieties have recorded bunch weights of 20 lb. or above under the perennial system of cultivation. The maximum bunch weight recorded is 32.4 lb. for the variety Pacha Batheesa a cooking variety.

2. *Hybridization*.—Five clones of *Musa balbisiana* were obtained from the Maharashtra Association of Science, Poona, and planted for use in hybridization work.

3. *Mutants and selections*.—The progeny test of the semi-tall type of the dwarf Australian variety Mons Marie shows that the mutant is breeding true.

4. *Propagation studies*—(a) *Selection of suckers*.—The trial was in progress for ten months after planting. The data available up to the date of cyclone show that sword suckers of both Monthan and Poovan varieties have recorded earlier flowering than broad leaved suckers.

(b) *Method of propagation*.—The available data indicate that for the Monthan variety the highest mean bunch weight is given by the plants raised from mother corm after harvest and for the Poovan variety by plants raised from bits of daughter suckers.

5. *Season of planting*.—The available data covering a period of harvest from February 1951 to September 1951 indicate that for the Poovan variety the highest mean bunch weight of 22 lb. 4 oz. is got for August planting and for the Monthan variety the highest mean bunch weight of 28 lb. 1 oz. for April planting under wet land conditions at Aduthurai.

6. *Ratooning trial in a wet land*.—The harvest data for the plant crop and part of the first ratoon crop could be had only up to the date of cyclone. The mean weight of bunch of the first ratoon crop for the plants harvested up to the date of cyclone for the Monthan variety worked out to 28 lb. 15 oz. and for the Poovan variety 29 lb. 13 oz. as compared to 27 lb. 4 oz. and 28 lb. 13 oz. respectively for the plant crop.

7. *Manurial trial in wet lands*.—The trial was completed during the year under report. The results indicate that the best manurial dose per plant is given by the treatment in which $\frac{1}{4}$ lb. nitrogen is applied as cattle manure (50 lb. of cattle manure on 0.5 per cent nitrogen basis) and $\frac{1}{4}$ lb. as ammonium sulphate (1 lb. 10 oz. of ammonium sulphate) in two doses, the first dose three months after planting and the second five months after planting, in addition to the basal dressing of 25 lb. of cattle manure per plant. The substitution of groundnut cake to supply $\frac{1}{4}$ lb. nitrogen either to replace cattle manure or ammonium sulphate has given the next best result. There is no response to the addition of potash or phosphoric acid for the heavy clay wet land soils of Aduthurai which are typical of the Tanjore Delta.

8. *Spacing trial*.—The available data indicate a trend towards heavier yields in the closely planted spacings during the first year.

9. *Soil culture*.—The yield data from the inception of the trial in January 1951 to the date of cyclone have indicated heavier yields from the plots under the treatment in which digging once a month is given. This trial has been relaid in the same site.

C. Programme of work for 1953-54.

1. *Systematic studies*.—The description of banana varieties growing under wet land and perennial unirrigated conditions will be continued. New varieties and species not represented in the collection will be added. Grouping of varieties based on morphological characters will be made to enable classification. Survey tours to cover representative banana tracts of the State will be made for systematic studies of varieties, spotting out mutants and collection of unrepresented varieties and species.

2. *Hybridization*.—The seedling nature of the important varieties will be studied using *Musa balbisiana* as male parent.

Work in the production of dwarf type of Monthan by back crossing the hybrid Monthan *Musa coccinea* (male) with the male parent to build a pollen yielding progeny will be done. *Musa chilocarpa* will be taken up for hybridization in improving the grade of Rasthali, Pacha Nadan and Nendran varieties.

The five clones of *Musa balbisiana*, *Musa Banksii* and *Musa acuminata* now in the collection will be taken care of, to be of use for hybridization work as per programme during next year, as these are expected to flower only then.

3. *Mutants and selections*.—Search for mutants will be continued. Progeny tests of selections of Poovan and Nendran made during the year will be made. Further tests of the semi-tall mutant of the dwarf variety, Mons Marie will be conducted.

4. Propagation and plantation practices—A. Propagation studies.—

[NOTE.—Though the repetition of most of the trials is necessitated by the cyclone, only the undermentioned ones will be initiated during 1953-54 due to want of space.]

(1) *Season of planting*.—The monthly planting trials of Poovan and Monthan under wet land conditions will be continued.

B. *Plantation practices*—(1) *Ratooning trial in wet land*.—This trial designed to assess the utility of taking one to three ratoon crops after a plant crop of banana will be repeated in the wet land area during the year.

(2) *Mattocking trial*.—The object of the trial is to study the influence of the extent of mattocking on the growth and performance of the sucker that follows. This trial will be repeated in the wet land area.

(3) *Improvement of perennial banana*.—(a) *Desuckering trial*.—Object.—To devise the optimum desuckering practice.

This trial was relaid after the cyclone in January 1953 and will be continued as per programme of work for 1951-52.

(b) *Spacing trial*.—Object.—To determine the optimum spacing in perennial plantations.

This trial is also being continued in the same site after the cyclone as detailed in the programme for 1952-53, giving spacing of nine, ten, eleven and twelve feet between clumps.

(c) *Manurial trial in perennial area*.—Object.—To obtain indications of the value of different manurial practices in perennial plantations. The trial has been relaid after the cyclone, adopting a factorial design designed by the Statistician to the Indian Council of Agricultural Research using three levels of nitrogen as ammonium sulphate, cattle manure or groundnut cake in combination with any two or alone and two levels of potash and two levels of phosphoric acid. There are in all 64 plots with 64 treatments. Growth and performance of the experimental plants will be recorded.

(d) *Soil culture*.—Object.—To determine the optimum frequency of soil digging in perennial banana plantations.

After the cyclone, this trial was also relaid in the same site in January 1953 and will be continued adopting four treatments as detailed in the programme for 1952-53.

(3) *Rice Research Station, Buchireddipalem (Nellore district)*.

A. General.

The season was not normal for paddy and the supply of water from the reservoir was not adequate. One three-inches filter point sunk was, however, useful for maintaining nurseries.

B. Results achieved during 1952-53.

1. *Pure line selection*.—One culture, viz., 42 in normal planted conditions and four cultures viz., 42, 151 BCP 1/76 and BCP/176 in late planted conditions in Molakolukulu, one culture, viz., 634 in Sannavadlu were found promising. Nine cultures in Red kesari and three in Potti kesari gave more than 10 per cent increased yield over their respective standards. Thirty promising lots were selected from Iswarakota single plants selections.

2. *Hybridization*.—(a) Thirty-two promising lots were selected for preliminary yield trials from one hundred and fifty-eight secondary selections in Kampan-samba cross progenies.

(b) From the thirty-two F5 progenies of BCP. 2 and 1834, eight best lots were selected for comparison with BCP. 2 and 1834.

(c) Ninety-six apparently blast-free selections from F4 progenies of Co. 4 × long duration strains and Co. 15 × Pishanam and ninety-five single plant selections from F2s of Co. 4 × BCP. 1 were made.

(d) In the yield trial with hybrid progenies of Iswarakota two cultures, viz., 1676 and 1678 gave 2.5 per cent and 4.6 per cent more yield than Iswarakota local.

3. *Introduction*.—Co. 25 gave significantly higher yield than BCP. 1 and Co. 26 and on par with BCP. 2 in late planted conditions.

4. *Blast study*.—(a) In normal planted conditions incidence of blast was significantly less on Co. 25 and Co. 26 in the case of 224 lb. and 336 lb. ammonium sulphate.

(b) The percentage of neck infection was found to be less in the plots with green leaf 8,000 lb. and 112 lb. superphosphate. Results are not significant on other blast study experiments. In the Government Mycologist's cultures, four cultures, viz., 8348, 3892, 7442/3 and 7009/6 were found to be promising as the infection was less than 10 per cent in these cultures.

5. *Cultural and manurial experiments*.—The results of dry ploughing experiment and phosphatic manurial trials were not significant.

6. *Other crops*.—Cotton among the three varieties—P213F, P216F and MU2 grown, MU2 seems to be late for the tract. P216F cotton grown as bulk in 3.09 acres in rice fallows came up well. The crop is still in the field. An acre yield of 1,036 lb. of kapas have already been obtained from the plots sown in the beginning of February.

Groundnut.—Groundnut crop sown in rice fallows came up well and TMV2 groundnut gave as much as 1,852 lb. of dry pods per acre from one plot. The average acre yield works out to 1,518 lb.

7. *Green manures*.—One thousand four hundred and sixty-one pounds of *Sesbania speciosa* seeds were collected from the plants planted along the field and channel bunds.

C. Programme of work for 1953-54.

Improvement of local varieties of paddy.—(i) *Pure line selections*.—The yield trials with promising cultures in each of the following varieties (a) Molakolukulu and secondary selections in BCP. 1, (b) Sannavadlu, (c) Masi pishanam and (d) short duration Kesari and Nallavari will be continued.

(ii) *Single plant selections* in Iswarkora, Sannavadlu, Bulk H and 2501 Molakolukulu will be under observation plots.

(iii) *Multiplication and maintenance of purity of strains released*.

2. *Hybridization*.—(i) Promising lots of secondary selections in Kampan samba cross progenies will be under preliminary yield trials; (ii) eight best lots from progenies of BCP. 2 × 1834 will be under preliminary yield trials; (iii) F5s of crosses between Co. 4 and other long duration strains will be studied for blast resistance. Culture 2092 will be compared with Co. 25; (iv) F3s of BCP. 1 × Co. 4 will be under observation for study of blast; (v) promising hybrid progenies of crosses with Iswarkora parent will undergo yield trials; (vi) further crosses will be effected between (1) Co. 4 × Pishanam, (2) Co. 4 × Sannavadlu and Co. 4 × Molakolukulu.

3. *Introduction*.—Co. 25 and Co. 26 will be compared with BCP. 1 and BCP. 2.

4. *Study of blast*.—(a) Study of incidence of blast (1) under different irrigational treatments, (2) different systems of planting, (3) by planting seedlings raised under wet and dry conditions, (4) by manuring different strains with different doses of ammonium sulphate and (5) by manuring with lime superphosphate and heavy dose of green leaf.

(b) Trial of strains and varieties by the Government Mycologist will be continued.

5. *Manurial experiment*.—Phosphatic manurial trials with bone meal and superphosphate with three levels of phosphoric acid, viz., 0 lb., 30 lb. and 45 lb. will be continued.

6. *Cultural experiment*.—Experiment with (a) dry ploughing, (b) dry ploughing and application of 4,000 lb. of green leaf and ploughing, (c) growing green manure, puddling in and planting and (d) keeping the field fallow, puddling after receipt of water and planting will be continued.

Others.—Collection of data for stem borer attack on bulk paddy will be continued.

Other crops.—Cotton and groundnut will be grown in rice fallows.

Vegetables.—Vegetables like snake gourd, ribbed gourd, bitter gourds and bendai will be grown on a small scale for the supply of seed.

Fodders.—Guinea, Thin Napier, water grasses and panicum antidotale grasses will be maintained for the supply of slips.

Fruit plants.—Mango stones and citrus seed will be sown for propagation.

(4) *The Pomological Station, Coonoor (The Nilgiris).*

A. General.

The number of plants including seedlings supplied during the year was 13,512 as against 11,733 supplied during the previous year. A total quantity of 39 lb. of seeds were distributed as against the previous year's figure of 6 lb.

B. Results achieved during 1952-53.

The growth and yield performance of Rome Beauty apple on Merton 779 and 778 has been the best among the five rootstocks under trial. Scion sticks of five hybrid apple selections received from Israel were propagated. Spraying trials with Sandolin 'A' during the second year of the trials, confirmed its superiority in hastening blossoming and promoting fruit yields, over its counterpart, linseed oil emulsion. A progressive accentuation of incompatibility between scions of plum varieties, Czar and Gaviota on plum seedling rootstocks has been evidenced in the trials in progress. Long pruned trees of plum Gaviota, Hale and Alu Bokhara continued to yield better crops than the short pruned trees.

New introductions during the year included Basella, Talinum, two varieties of apricot, avocados and Giant Granadilla. In straw-berry and pyrethrum, the multiplication of the clonal progenies of the high-yielding 'lines' has been taken on hand for distribution of planting material to the growers.

C. Programme of work for 1953-54.

Further work to extend the trials on hand and towards enriching the existing collections with new and improved varieties and types will be undertaken. The trials to increase crop yields through improved cultural practices, such as pruning and training, irrigation, use of hardy and disease resistant rootstocks, top-working of suitable pollinisers and self-infertile plum trees, isolation of high yielding strains and individual trees of merit will all be continued on approved lines.

(5) *Sim's Park, Coonoor (The Nilgiris).*

A. Results achieved during 1952-53.

(a) *Annuals—Growth, flowering and performance of annuals*.—The data collected on annuals over four seasons were used to classify the annuals growing at the Sim's Park into different categories based on their duration, period of growth, period of bloom, height, etc. These have been of value in utilizing the various annuals for different designs based on their colour, height and seasons of flowering.

(b) *Study on the performance of shrubs*.—The observations collected for nearly three seasons have made possible the classification of the shrubs at the Sim's Park into four main groups, based on their flowering periods, unlike the past when only three groups were possible.

(c) *Taxonomic studies on Eucalyptus species*.—This study which was taken up in 1951 with the object of providing a key for the identification of the various species of Eucalyptus numbering to 36, which exist in the Sim's Park, was completed during this year. Complete taxonomic descriptions of each species was made and 36 species were described. The descriptions have revealed the possibility of identifying the different species by such characters as the nature of the bark, nature of the flower and inflorescence, shape of the adult and juvenile leaves branching, etc.

(d) *Taxonomic studies on Roses*.—With the same object as explained under Eucalyptus, descriptions (Taxonomic) of the different varieties of Roses that are in the Sim's Park were made. So far 64 out of the 75 varieties have been described. From the observations recorded, it has been found possible to identify many of the rose varieties by such of the vegetative characters as the number of leaflets in the compound leaf; shiny nature of the leaves, folding habits of the leaves, colour of the tender shoots, thorns and emerging leaves, etc.

(e) *Seed viability studies on Eucalyptus citridore, Eucalyptus ficifolia and Jacaranda mimosaeifolia*.—From the results obtained, it is seen that only fresh seeds record maximum percentage of germination of 80 per cent in *Eucalyptus citridore*, 60 per cent in *Eucalyptus ficifolia* and 94 per cent in *Jacaranda mimosaeifolia*. It is also seen that for obtaining maximum results with *Eucalyptus ficifolia* the seeds should be as fresh as possible while in *Eucalyptus citridore* and *Jacaranda mimosaeifolia* they can at best be stored to 2 months and 15 months respectively after which period the germination falls below 70 per cent.

(f) *Propagation studies on Araucaria Bidwillii*.—The data collected over a period of two years show that the period from July to December is the best suited for the planting of these cuttings for rooting. The results in general are consistent in both the years.

B. Programme of work for 1953-54.

Besides the studies on annuals, shrubs and trees to be continued, new trials like (1) acclimatisation of choice annuals for seed production, (2) pre-treatment of seeds for obtaining maximum germination and (3) propagation of plants by air-layering methods are proposed to be taken up.

(6) *Central Farm, Coimbatore.*

A. General.

During the year the average yield of paddy for the first crop was 2,600 lb. per acre. For the second crop of paddy modified Japanese method of cultivation was adopted and the average acre yield worked out to 2,650 lb. A total quantity of 11,948 lb. of nucleus paddy seed was supplied to the districts.

B. Results achieved during 1952-53.

Paddy.—MTU. 22 excelled the local standard in yields. SR. 26B gave double the yields over local cultures under saline conditions.

2. *Sugarcane*.—Co. 449 of plant crop and Co. 527 of ratoon crop gave maximum yields. Co. 527 recorded best quality jaggery.

3. *Banana*.—Among the 20 varieties under trial Karpura Chekrakeli and Kostha Bontha gave maximum yields.

4. *Ragi*.—AKP. 6 gave 12 to 42 per cent increased yields over local. It was found to be earlier in duration than the local by a fortnight in "Punasa" and a week in "Pyr" seasons.

5. *Pulses*.—Redgram culture 72, Horsegram culture 116, cowpea Co. 419 recorded maximum yields.

6. *Oilseeds*.—In rice fallows TMV. 1 gingelly recorded a yield of 358 lb. seed. K2 linseed was the best yielder recording 650 lb. per acre under splash irrigation.

7. *Cotton*.—Variety 336B gave maximum yields of 419 lb. of Kapas per acre under rain-fed conditions in sandy loams.

8. *Gogu pusa*.—Gogu followed by Kasi gogu recorded double the yields of yerra gogu and tella gogu in sandy loams under rain-fed conditions.

9. *Perennial grasses*.—Five cuttings taken during the year in Buffaloe grass recorded 28,530 lb. of green fodder per acre.

10. *Green manure*.—*Sesbania speciosa* and Daincha grown in rice fallows recorded 35,333 lb. and 33,000 lb. of green matter per acre without any irrigation.

11. *Vegetables*.—Wynaad cucumber recorded double the yields of local and is suitable for curry and not for pickling.

C. Programme of work for 1953-54.

1. Studying the effect of placement fertilizers, namely, superphosphate and sulphate of ammonia on paddy.

2. Comparative trials of fodder grasses.

3. All the trials which have not yielded conclusive results during the previous year, will be relaid.

(7) *Agricultural Research Station, Hagari (Bellary district).*

A. General.

The growth of the several crops and their performance were below normal due to unfavourable seasonal conditions. The rainfall recorded during the year was 11.78" as against 19.44" received in 1951-52 and the ten-year average of 19.35".

B. Results achieved in 1952-53.

The rotation experiment was repeated and the previous results were corroborated. Rotation of crops was found to be much better than no rotation. A pulse crop was found to confer greater benefit on a succeeding crop than fallow. The study of the results of application of groundnut cake and superphosphate both on jonna and cotton was continued. Both groundnut cake and farm-yard manure proved beneficial for both cotton and jonna under favourable rainfall conditions. Superphosphate did not affect cotton either in earliness or yield and unlike in the previous two years, no earliness in jonna also was noticed. The co-ordinated crop weather scheme was continued as per programme.

Under crop improvement *Setaria* could not be sown due to complete failure of the south-west monsoon. In sorghum, nine cultures were under yield trials. Four cultures under yield trials gave higher yields of grain over the controls though the yield differences were not significant. In the preliminary yield trials, none gave higher grain yields but seven cultures gave higher straw yields. Thirty-six F2 progenies and 36 F4 and F5 progenies were under study. In safflower, twelve cultures and five bulks were under comparative yield trials in three series. In addition 212 single plants were under observation.

C. Programme of work for 1953-54.

Agronomic and manurial experiments.—The rotation experiment and three out of the four manurial experiments will be continued. The experiment where the effect of superphosphate on cotton is studied will be dropped as no positive result was recorded over five successive years. Two more new experiments will be taken up wherein it is proposed to study the effect of ammonium sulphate, and groundnut cake alone and in combination over a basal dressing of farm-yard manure on cotton and jonna.

The co-ordinated crop weather scheme will be continued as per approved programme.

Crop improvement—Setaria.—The programme drawn up for 1952-53 will be executed as it is.

In Jonna, nine cultures will be under yield trials and eight cultures under preliminary yield trials. Further, 36 F3 cross progenies and 32 F4 and F5 cross progenies will be under study.

Ragi.—The cultures E.C. 4573 and E.C. 4310 sent by the Millet Specialist will continue to be under observation along with H. 1. Multiplication of seed of H. 1 and Co. 1 will be continued.

Safflower.—Comparative trials of the 12 cultures and five bulks will be repeated. Eighty-eight apparently pure cultures isolated from the previous year's crop will be under preliminary yield trials. In addition 150 fresh single plants will be under study.

Onions.—Two types of onions (Ambasamudram and Tenkasi) are being maintained.

Seed multiplication of the approved strains of the tract in *setaria*, sorghum, cotton and ragi will be continued. Seeds of indigenous vegetables and economic plants will be collected for distribution.

Growing of gliricidia, green manures and compost making will receive special attention.

(8) *The Kallar and Burliar Fruit Stations (The Nilgiris.)*

A. General.

The number of plants including seedlings supplied from the two stations was 17,325 as against 8,595 of last year, while the quantity of seeds sold was 211 lb. against 42 lb. in the previous year.

B. Results achieved during 1952-53.

A record yield of 492 and 584 fruits per tree during the monsoon and summer seasons was recorded in mongosteen. The seedling progenies of seven selected parents were established satisfactorily in the field. In the rootstock trial for the mandarin orange at Kallar, the growth of plants on Jamberi continued to be vigorous and those on sweet lime and pummelo the poorest in growth. Hybridisation work in citrus and annonas resulted in the hybrid seed material of five and three parental combinations respectively. The hybrid seedlings are under observation. Floral biological studies were undertaken in two varieties of pine-apple with a view to effect hybridisation for the production of progenies possessing desirable qualities. Propagation trials with jack showed that inarching was a successful method of vegetative propagation of this fruit. Three more selections of jack from promising trees in Malabar, South Arcot and Tanjore were added to the collection.

Rootstock material for proposed trials with clove and nutmeg were being assembled and propagation work on these will be undertaken in the ensuing year. New introductions during the year included avocados from Ceylon, oysternut and persimmon.

C. Annual programme of work for 1953-54.

Improved work on fruits and other horticultural crops peculiar to the humid tropics such as mangosteen, mandarin orange, jack, annonas, durian, avocado, clove, nutmeg and cacao will be continued. Trials to determine suitable rootstocks and an optimum method of propagation for mandarin orange, jack, annonas, clove, nutmeg, etc., will be pursued. Hybridisation work to evolve new and promising types of citrus, pine-apple, banana, annonas, etc., will be pursued on planned lines. Efforts will continue for the enrichment of the collection through new introductions, location of bud sports, etc.

(9) *Fruit Research Station, Kodur (Cuddapah district).*

A. General.

A total of 19,220 plants including seedlings was supplied from the station as against 12,029 supplied in 1951-52.

B. Results achieved during 1952-53.

Mango.—Cropping in general was poor in all the varieties among the polyembryonic rootstocks, the varieties, Pahutan and Goa were adjudged as promising for the two commercial varieties Baneshan and Neelum. A total of 8,467 controlled pollinations was made resulting in crossed fruits from six combinations. Among the earlier hybrids, three trees fruited for the first time, and one combination of Bangalore X Himayuddin was found promising judged on the basis of fruit quality.

Citrus.—Among the varieties that yielded a crop, four of sweet orange, one of mandarin, two in each of pummelo and lemon performed well during the period under report. The pink fleshed Vadlapudi mutant again scored

over the ordinary Vadlapudi in organoleptic tests. Analysis of sathgudi oranges from trees on different rootstocks had indicated that fruits on sathgudi rootstock have ranked first while the threes on Ganjaimma, acid lime Kichili and Jamberi were leading over the rest. In the acid lime rootstock trial the average individual trees yields worked out to 8,095 fruits as against 4,694 fruits of the previous year, while there was no significant differences in yields, among the three rootstocks. In the newly established rootstock trial sathgudi on Jamberi and acid lime on Jamberi and Ganjaimma made greater extension growths than on other rootstocks. Hybridisation work begun last year was continued this year also resulting in crosses in five new combinations. The crossed fruits were developing at the time of the report. A survey of the orchards in Krishna district during the year for a study of the performance of different scion combinations brought home the fact that the trees of Sathgudi on sour orange and Batavian on acid limes appear to be more satisfactory than the others. The trees on Jamberi though vigorous were susceptible to disease infection.

Other fruits.—Hybridisation in guava for the second-year resulted in the availability of fruits of eight more parental combinations. They were developing and under observation. New fruit introductions included four varieties of mango, one of Zizyphus, Talinum and Red Roselle.

C. Programme of work for 1953-54.

1. Variety collections: The study of the performance of the individual trees in the varietal collections in respect of growth yields, fruit quality, etc., will be continued for isolation and perpetuation of promising trees and types.

2. Trial on methods of propagation in relation to performance in mango.—Data on growth yields, etc., will be collected for analysis.

3. Double working trial for mango. Studies on the performance of the trees already planted for the trial will be pursued.

4. Polyembryonic rootstock trial for mangoes: Studies on the performance of the trees of polyembryonic and mono embryonic stocks will be pursued.

5. Further studies on the behaviour of each class of shoots are to be continued.

6. Top working inferior trees in mango: Comparison of the growth and performance of fresh grafts and top worked trees will be made in the next season.

7. Cultural practices versus green manuring in mango.—This is a long range programme and hence observations, on growth, flowering and fruiting will be continued for a number of years.

8. Citrus rootstock trials.—Observations in the existing plots under Sathgudi and acid lime rootstock trials will be continued. Similar observations will be made with the newly planted rootstock trials for sweet orange, lime and lemons.

9. Isolation of clonal strains mango.—Observations on the variety of fruit quality caused by environment, position, etc., and that due to bud variation will be continued.

10. Exploitation of bud sports in citrus.—In addition to the study of the performance of clonal selections, search for outstanding types will be continued.

11. *Manurial trials for Sathgudi.*—The influence of different doses of nitrogen applied at varying intervals on the cropping in sathgudi will be studied.

12. *Hybridisation.*—Study of the hybrid progenies in mango, citrus and guava will be made.

13. *Irrigation trial in Sathgudi.*—Studies to determine the effect of different frequencies of irrigation on growth, yields and cropping behaviour of sathgudi trees will be undertaken.

14. *Studies in fruit changes at different periods of harvest.*—This study has been newly taken on hand to observe the effect of retaining fruits for different periods on the tree.

15. *Pruning trials in guava.*—Studies to devise an optimum practice of pruning for the guava will be pursued.

(10) *Agricultural Research Station, Koilpatti (Tirunelveli district).*

A. General.

Due to the extreme drought, all the major rainfed crops of the tract failed and all the agronomic experiments of the dry lands did not give any conclusive results.

B. Results achieved during 1952-53.

(a) *Cotton Breeding.*—The evolution of strains better than cotton K2. was in progress and four selections having a staple length of 1" and more have reached the multiplication stage during this year.

(b) *Milletts*—(1) *Cumbu.*—In hybrid cumbu work, four new combinations have given significantly higher yield than the strain K1. under irrigated conditions.

(2) *Irungu Cholam (rainfed).*—The periamanjai irungu even during this year yield than the irungu cholam strain K1. of this tract, indicating its suitability even during years of drought.

(3) *Ragi (Irrigated).*—In yield trials, two cultures, KR.4, and KR. 76 gave significantly higher yield than the existing K1. The cultures/strain KR.4, unlike the strain Ragi K1 has an advantage of possessing non-lodging habit which is an economic character.

(4) *Vellai Cholam (Irrigated).*—The two economic cultures, KS. 288 and KS. 296/4 have given higher yield than the existing strain cholam K2 for the second year in succession.

(c) *Agronomic studies—Irrigated Crops.*—A time of showing experiment was conducted with all the important irrigated millet crops of the tract. For Vellai cholam the optimum time of sowing is during the month of April. It can also be grown fairly successfully during the months of July, August and September. Periamanjai irungu can be sown from June to September. It is a partial failure when sown during the other months. The main season cumbu can be grown successfully during the months of June and July. For kullam cumbu the optimum time of sowing is found to be April to July. For Ragi the optimum time of sowing is during the months of June to August. The crop does not produce any yield when sown from January to May.

(d) *Miscellaneous crops that can be grown under rainfed condition in the Black soil.*—Safflower has been found to be suitable for the tract and was found to give 650 lb. of grain during normal years.

(e) *Poultry.*—The Rhode Island red breed of poultry was maintained and 1,213 hatching eggs were distributed in this tract. Although this breed has the advantage of meat production cum good laying capacity it is not suitable for the South Indian conditions due to its fragile nature. Hence a start was made during 1951-52 to hybridize the Rhode Island red breed with the Indian game breed. The F1. Generation had an average of 150 eggs per year and did not have the breeding habit. The F2 generation did not have the breeding habit. The F2 generation was raised during the year under report. A total of 96 birds were hatched out and these were reared in a pen in which all the diseases which attacked the foreign breed of poultry remained. All the chicks were exposed to this disease and among these only 35 have survived. Birds with economic characters good laying, non-breeding habit and heavy body weight would be fixed up for raising the F3 Generation.

C. Programme of work for 1953-54.

(a) *Cotton Breeding.*—Evolution of high yielding strains would be carried on by the Assistant Cotton Specialist, Karunganni Scheme, Koilpatti. The four high yielding economic cultures with staple length of one inch would be tried in the district to study their suitability to the tract.

(b) *Milletts Breeding*—1. *Cumbu (Rainfed).*—Economic pure line cultures are to be evolved. Crosses are to be made to find out suitable combinations of pure lines which can manifest hybrid vigour and can out yield strain cumbu K1. The yield behaviour of the four economic combinations, already fixed up are to be confirmed. The hybrid cumbu strain X1 and X2 are to be tried extensively in the entire tract comparing them with the strain K1 and the local.

(2) *Irungu Cholam (Rainfed).*—The periamanjai irungu (AS. 7,081) is to be spread in the entire tract for its grain and straw production. Economic bold grain types of periamanjai, irungu to be evolved by pure line selection from the periamanjai irungu bulk.

(3) *Ragi (Irrigated).*—The economic culture Ragi K.R.4. would be tried in the districts to find out its suitability to the tract. The four F5 generation of the pure lines of the crops between the Ragi K1 and a non-lodging type would be studied in the preliminary yield trials.

(4) *Vellai Cholam (Irrigated).*—The two economic cultures K.S. 288 and K.S. 296/4 would be tried extensively in the districts. Further pureline selections would be continued.

(c) *Agronomy.*—All the agronomic experiments will be repeated to get conclusive results.

(d) *Miscellaneous—*

(1) *Miscellaneous Crops.*—Trials of sweet potato, fodder grasses and vegetables (Brinjal, lablab, chillies and potato) will be continued.

(2) *Poultry.*—The F3 Generation of cross between the Rhode Island Red breed and the Indian game breed to be raised and suitable parents to be selected for further work.

(11) *Agricultural Research Station, Lam. P.O. (Guntur district).*

A. General.

Though the rainfall was very scanty an untimely rain in December, compensated the deficiency resulting in good harvests.

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B. Results achieved during 1952-53.

1. *Cotton*.—Maintenance of nucleus seed. A two acre plot of Coconadas I Cotton and 1 acre with Coconadas II Cotton were raised during the year. C1 and C2 cotton were selfed. Two hundred and ninety-five lb. of non-selfed seed and 63 lb. of selfed seed were obtained from C1. The C2 cotton gave 170 lb. of non-selfed seed and 45 lb. of selfed seed.

2. *Perennial cottons*.—As in the previous years Moco maintained its superiority over other types in yield. Moco. 4. has recorded 7.47 ounces per plant on an average while other types recorded 0.53 ounces per plant in Barbados type II, 3.94 ounces per plant in Barbados type IV 2.44 ounces per plant in Quabvadinhe and 0.78 ounces per plant in Barbados type I.

3. Chilli Cotton mixed trials.

3-A. *Replicated trials*.—Indications to the effect that Lakshmi among American types and C. 5 20/2 among desi types which may be suitable for the trial work were obtained.

4. *Agronomic trial*.—To observe the effect of crowding and increasing population on early maturing types a replicated trial was laid with four treatment, viz, 197.3 close spacing 197.3 normal spacing, H. 420 close spacing and H. 420 normal spacing. H. 420 was found to be better in vigour than 197.3 in both normal as well as close spaced plots. H. 420 was found to be earlier than 197.3 in flowering in both close spaced as well as normal spaced plots.

5. *Leguminous crops and effect on cotton*.—Cotton after either jonna or groundnut recorded significantly higher yields than when the previous crop was either redgram or groundnut redgram or jonna redgram. There was no effect of manure either with P. 205 or N on the succeeding cotton crops.

6. *Coriander*.—Breeding for a high yielding quality strain was continued. Five single plant selections two from each of Guntur 14 and Koilpatti 15 bulks and one from Mudakulathur bulk were found to be significantly better in yield than Ongole local bulk.

7. *Trial of Linseed varieties*.—An observation plot with linseed varieties 1-P-1-6, 1-P-1-II and 1. 1-65 was raised. 1-P. 1-II gave 112 lb. and 8 ounces of seed followed by 1-p. 1-6 which gave 108.5 lb. of seed per acre. 1-P. 1-65 gave the lowest yield of 57.9 lb. of seed per acre. 1-P. 1-6 is earlier in duration by ten days to both the other varieties.

8. *Seed Multiplication of Bengalgram*.—Bengalgram culture 482 supplied by the Pulses Specialist yielded at the rate of 855 lb. of seed per acre.

9. *H. S. 9 tobacco*.—H. S. 9 tobacco was raised for seed purification 20 typical plants were selfed and the produce was separately collected and kept for further work.

C. Programme of work for 1953-54.

1. *Cotton*.—Maintenance and seed multiplication of C 2 Cotton Seed multiplication of H. 420 cotton.

2. *Chilli cotton mixed trials*.—Dibbling H. 420 cotton in standing groundnut. Spacing trial in cotton.

3. *Coriander*.—Growing and studying single plant selections in replicated row yield trials study of bulk samples of extra State and extra Indian types in replicated plots. Study of correlation between pigment, mericarp, size, earliness, habit and yield.

4. *Groundnut*.—Trial of groundnut varieties in replicated plots.

5. *Tobacco*.—Maintenance of purity of H. S. 9 tobacco.

6. *Other trials*.—Rainfall and crop yield correlation trial, nightsoil compost experiment, chilean nitrate observation trials; Trial of tobacco stems as manure for dry land. Scheme for the supply of organic matter to dry lands, study on the possibility of raising short duration crops prior to virginia tobacco and rotation of tobacco and Siruguppa wheat; Observation trial of linseed varieties; Maintenance and seed multiplication of G. 1 G, 2 and G 4. Jonna and G 1. Korra strains. Close planting vs. local method of bunch planting of chillies.

(12) *Paddy breeding station, Mangalore (South Kanara district).*

A. General.

A total quantity of 29,828 lb. of first and second crop seed paddy was made available for distribution in the district. About 135 lb. of vegetable seeds, 5,200 Gliricidia seedlings, 502 banana suckers and 278 Malta lemon rooted cuttings were distributed.

B. Results achieved during 1952-53.

1. *Improvement of local varieties*. One red riced Kayama culture No 1367 was released as strain MGL. 2. One Halluga culture 1828 which recorded increased yields ranging from 10-20 per cent over local in the district is ready for release as strain. Nine cultures in four varieties, white riced Kayama, Mascathy, Kanwa and Athikrya are in the final stages of trial both at the station and in the district.

2. *Improvement by Introduction*.—The study of pure lines was continued with a fresh batch of 109 cultures. Strain MTU. 20 Punasa Basangi was found suitable for the single crop area due to its earliness, no lodging habit and heavy yielding capacity.

3. *Improvement by Hybridization*.—Crosses were effected to evolve a non-lodging strain of local first-crop varieties and for the evolution of a non-deteriorating type of Co 3 type of strain, hybrid-cultures 8360 and 8448 which retained their viability under ryots conditions were multiplied for further trial.

4. *Manurial experiments*.—Work on manurial aspects were taken up recently. Though it is not too early to draw any definite conclusions, the results indicate (i) green leaf was significantly better than cattle manure. (ii) Heavy yielding strains respond better under manured condition.

5. *Other crops*.—(i) *Sweet potato*.—In the manurial trial, there are indications to show that applying the full dose of manure at planting is better than applying one month after. In the cultural experiment, no differences were noted between the flat or erect method of planting.

(ii) *Groundnut*.—The scope of raising groundnut in rice fallows without any irrigation, both in the single and double crop wet lands appears to be very limited. The chances of raising a good crop under irrigation appear to be bright.

(iii) *Green manures*.—*Sesbania speciosa*.—The possibilities of raising a pure crop of *Sesbania speciosa* in the dry land or single crop wet land during the monsoon season to provide green matter for the second crop, appear to be bright, one acre of dry land to supply enough green manure for at least 5-6 acres of second-crop area.

C. Programme of work for 1953-54.

1. *Improvement of local varieties* (i).—Laying out trials in the district. Two cultures of white riced Kayama, one culture of Mascathy and two cultures of Kanwa, during the first-crop season and two cultures of Athikrya during the second-crop season with simultaneous yield trials at the station.

(ii) Multiplication of seed in the above, as well as other promising cultures and strains already popular in the district.

(iii) Selecting a fresh batch of single plants from a representative sample of local Mascathy better than the culture under trial.

(iv) Study of the single plant selections of Halluge isolated during the previous season in observation plots.

2. *Improvements by introduction*.—Study of strains and varieties obtained from other stations and laying out yields trials of promising cultures during all the three seasons of the year.

3. *Improvement by hybridization*.—(i) Study of the F₂ progenies of the following crosses:—

MGL. I × MTU—3

Co. 3 × PTB. 20.

PTB. II × MTU—4

Co. 3 × 8448.

(ii) Laying out yield trials of economic progenies of Co. 3 × PTB. 19 and natural cross progenies of Kavanigenpoothala.

4. *Manurial trials*.—The following manurial trials will be laid out.—

(i) Deleterious effects (if any) of the continuous application of ammonium sulphate with and without green leaf.

(ii) Effect of high yielding strains on soil fertility.

(iii) Efficacy of chilean nitrate as manure for paddy.

(iv) Efficacy of calcium carbonate slurry as soil corrective.

(v) Relative merits of the two forms of phosphate—Super-phosphate and bonemeal, over a basal dressing of cattle-manure and green leaves.

(vi) Residual effect of limings.

5. *Cultural trials*.—(i) Japanese method of paddy cultivation, viz., Farm method.

6. *Other crops*.—(i) *Sweetpotato*—(a) *Cultural trial*.—To determine the proper method of planting setts.

(b) *Manurial trial*.—To determine the proper time of applying manure.

(ii) Groundnut to explore the possibilities of raising a crop of groundnut in rotation with paddy.

(iii) *Green manures*.—*Sesbania Speciosa* to find out the optimum conditions to realize maximum quantity of organic matter and production of seed.

(13) *Agricultural Research Station, Maruteru (West Godavari district)*.

A. General.

During the year 152,031 lb. of paddy seeds, 1,335 lb. of *sesbania* seeds, 206½ lb. of *Glyricidia* seed were supplied from the Station.

B. Results achieved during 1952-53.

1. Pure line selection one culture in Pedda Kusuma was released as strain MTU. 22. Two promising cultures in Pedda Atragada were multiplied.

2. In the rainfed varieties, 18 high yielding cultures were carried forward for further trial. As a result of a study of the cross progenies, eleven pure breeding progenies, in Krishna Katukulu, four in Konamani duration, seven in Atragada duration, five in Vankisannam duration, four in Sannakusuma duration and two in GEB. 24 duration were selected for yield trials during 1953-54. In all, 850 progenies in F₃ to F₉ generations have been selected for further study in 1953-54.

3. *Manurial experiments*.—In the experiment conducted with compost and farmyard manure on 60 lb. N. basis, the differences were not significant. In the experiment where phosphatic manure was applied direct to paddy crop and indirectly through green manures, the differences were not significant. In the experiment to find out the utility of *sesbania speciosa* in the dry form on rice, the results indicated that though the treatment differences were not significant, the application of fresh leaf gave the maximum grain yield.

4. *Agronomical studies*.—In the trial with placement of ammonium sulphate, it was found that placement has not produced any marked increase in yield.

C. Programme of work for 1953-54.

I. (a) *Pure line selection*.—(1) Maintenance of purity and multiplication of the 22 Maruteru strains released.

(2) Multiplication of promising cultures isolated in Atragada and Kusuma.

(3) Yield trials of 27 promising high yielding cultures of strains against their respective standards.

(4) Yield trial of 4 Akkulu cultures against MTU. 1 and SLO. 13.

(b) *Hybridization*.—(i) Yield trials of pure breeding cultures 11 of Krishnakatukulu, four of Konamani duration, seven of Atragada duration, five of Vankisannam, four of Sanna Kusuma duration and two of GEB. 24 duration.

(ii) Intensive study of cross progenies and other selections.

II. *District trials*.—Three cultures in Krishnakatukulu and four cultures of Akkulu in East and West Godavari, two of Konamani in East Godavari, two of GEB. 24 duration in West Godavari and Krishna districts, one of Kusumma in Kistna and Guntur districts and two of Pedda Atragada in Guntur district.

III. *Agronomic and manurial trials*.—(i) *Organic matter requirements of the soil*.—To determine the organic matter requirements of the soil in the shape of cattle manure, green manure and compost with a basal dose of 60 lb. phosphoric acid as super phosphate and a top dressing of 45 lb. nitrogen as ammonium sulphate three weeks after transplantation for short and four weeks after medium and long duration varieties. Farm-yard manure at 2,500 lb., 5,000 lb. and 7,500 lb. per acre will be applied and green leaf and compost will be applied on the organic matter basis of the above quantities of farm-yard manure.

(ii) *Permanent manurial experiment*.—To find out the direct manurial value of organic manures and inorganic fertilizers and to find out the necessity of liming the soils for correcting the acidity, if any, is developed.

(iii) *Nutrient requirements of rice.*—To find out the economic dose of nitrogen and phosphoric acid for rice with 4 levels of nitrogen as ammonium sulphate (0, 30, 45 and 60 lb.) and 4 levels of phosphoric acid as super phosphate (0, 30, 45 and 60 lb.) individually and in combination.

(iv) To determine the best method of application of phosphatic manures to rice either direct application to rice or indirect application to the preceding green manure crop and to determine also the best green manure that responds to this treatment in single and double crop areas.

(v) Utilization of *sesbania speciosa* in the dry form on the basis of 4,000 lb. of green matter in the first crop season and 6,000 lb. in the second crop season.

(vi) To find out the relative merits of Japanese method of rice cultivation over the local method.

(vii) Studies on control of stem borer with DDT. And BHC in two concentrations each for DDT, 0.1 per cent and 0.2 per cent and for BHC, 0.05 per cent and 0.1 per cent.

(14) *Agricultural Research Station Nandyal, (Kurnool district).*

A. General.

The annual rainfall during the year was just about half the normal. The early short duration crops fared badly while the late crops yielded well during the year.

B. Results achieved during 1952-53.

1. *Cotton.*—The breeding work on White Northern Cotton was continued. The spinning quality of the four strains in the district trials was found to be as good as N. 14. In family blocks one strain was found to be pure with lint length and yield equal to N. 14 and ginning percentage and strength being better. In progeny rows, although there was none better than control in yield of kapas, every one excelled in ginning outturn by 6 to 8 per cent.

2. *Sorghum.*—Work on Mungari patcha jonnas received much attention during the year and the results have been very encouraging. One selection N.J. 41 a selection from Sandur area recorded 22 per cent increase in Sandur, consistently for the third year. Another selection N.J. 53 and yielding 23 per cent increase in Adoni, while N.J. 84 and N.J. 293 gave 12 to 49 per cent more than local types in Hindupur and Penukonda taluks.

Works on Hingari (late season) Patcha jonna consisted of maintaining pure nucleus seed plots and multiplying the strains under distribution for supply of seed for primary seed farms. A total of about 24,300 lb. of pure seeds of 12 strains suitable to different zonal areas was distributed from the station for primary seed farms.

The breeding of striga resistant types of sorghum by Hybridization and control of striga by agronomic and chemical methods were continued.

3. *Groundnut cotton mixture.*—Trials were concluded with this year's trial. It was found that mixtures were more paying and that a late type of cotton like 881 F suited better than early types for mixtures on deep soils. In the experiment to study the economics of various mixtures cotton mixtures were more remunerative than redgram mixtures.

C. Programme of work for 1953-54.

Breeding programme of White Northern Cotton and Patcha Jonnas will be continued. Redgram trials with pulses Specialist's strains will be repeated.

Multiplication and maintenance of pure seed of the various strains under distribution will be continued. The strains for multiplication will be GEB. 24 and 8612 in Paddy, N. 1 to N. 12 in Jonna, N. 1 Korra, N. 14 5202, 5975 in cotton, TMV. and T.M.V. 3 in groundnut and No. 37 in redgram.

Experiments on green manuring of dry lands as soil amendment as per suggestions of the Government Agricultural Chemist will be started.

(15) *Agricultural Research Station, Nanjanad (The Nilgiris).*

A. General.

A total quantity of 49,338 lb. of seed of Great Scot variety of potato was supplied to the cultivators from that produced at the station.

B. Results achieved during 1952-53.

1. *Varieties.*—In all 22 promising varieties and cultures from the Netherlands and the Central Potato Research Institute, Patna, tested for yield, were carried over for further trials.

2. *Cultural trials.*—It was conclusively proved that mulching of the potato crop with waste vegetable refuse resulted in improved yield returns.

3. *Manurial trials.*—Investigations on the effects of various forms of nitrogenous fertilizers, graded doses of nutrients like nitrogen and phosphoric acid and biproducts like slurry now going to waste, were initiated.

4. *Miscellaneous.*—Plants of economic importance like blue gum and wattle and also newly introduced trial crops for green leaf, soil cover and forage, were raised.

5. A supply of 1,024 lb. of certified class (A) Great Scot seed was obtained from the United Kingdom. This seed recorded acre yields of 16,326 lb. and 12,952 lb. in the main and irrigated crop respectively against 11,960 lb. and 12,316 lb. recorded by the farm seed during 1952-53 season.

C. Programme of work for 1953-54.

Potato.—(1) Multiplication of important varieties and cultures and disease-free Great Scot seed.

(2) Studies of the spacing of potato seed for optimum yield;

(3) Manurial trials with (a) different forms of nitrogen carriers, (b) graded doses of nitrogen and phosphoric acid, (c) Calcium carbonate slurry, (d) magnesium sulphate applied to the soil and the plant as spray (e) semi acidulated rock phosphates like Kotka Phosphate, (f) divided applications of Nanjanad mixture and (g) organic manures like green leaf and cattle manure compost, on the yield of potatoes. Extensive trials on winter cropping of potatoes in all the districts and Research Stations of the State will be undertaken.

Other crops.—New introductions of plants of economic importance will be made under approval.

Publications.—Original papers of scientific and popular interest will be published, in continuation of the impressive record already set up in this direction.

(16) *Agricultural Research Station, Pilicode—Nileshwar II and III.*

A. General.

During the year 44,872 selected seedlings were distributed and a total of 60,000 selected seed coconuts were procured and planted in 1952—Nursery.

B. Results achieved during 1952-53.

Coconut depth of planting experiments; among the two depths of planting, viz., 3 feet and 6 feet deep adopted for planting coconuts in the sandy soil it is observed that 3 feet deep planting is better than 6 feet deep planting.

2. *Coconut breeding*.—The study of the progenies of coconut obtained under different methods of pollination and from different types and varieties of palms confirmed the previous year's findings, viz.,

(a) Selfing in coconut as a method of crop improvement is not useful as selfed progenies are the least vigorous in growth as well as in their yield characters;

(b) progenies from low yielding palms especially those yielding 40 nuts and below per tree per year are generally poor and not suitable for propagation;

(c) progenies of intra-varietal crosses among the West Coast tall varieties of different character combinations have not indicated encouraging results;

(d) progenies of the inter-varietal crosses between the West Coast tall and the dwarf continue to be quite outstanding in respect of all the economic characters.

3. *Experiments to increase the humus content of the soil*.—*Crotolaria strains*, a leguminous weed, was found by trial to be the best green manure crop for the coconut gardens on the West Coast.

Gliricidia is found to be the best green leaf yielding plant best suited particularly for West Coast conditions this year also.

Indigofera teimanii.—A green manure plant resembling *gliricidia* tried during the year appears to be a useful introduction.

Calapogonium and peuraria.—Appear to be good cover crops for the sandy loamy type of soils.

4. *Trials of subsidiary crops*.—Pine apple, tapioca, elephant yam and dry paddy are promising crops suitable for growing as subsidiary crops in the shade of the coconut. The spreading variety of groundnut could also be very successful grown as a subsidiary crop under rainfed conditions.

The growing of subsidiary crops does not adversely affect the main crop of coconut.

5. *Watering experiment*.—Watering of the coconut trees in the summer months is observed to have brought about an alround improvement in the condition of the trees.

6. *Study of varieties of palms*.—Among the palms under the exotic collections under study, it is observed that Laccadive ordinary, Laccadive small, Andaman ordinary, Phillipines and Cochine china are economic types suited for propagation.

7. *Spraying trials against rhinoceros beetle*.—Spraying the crowns of coconut trees with guesarol 550 at weekly intervals is found effective in reducing the beetle attack.

(1) *Manurial experiments*.—(a) To find out the best method of applying manures to the coconut in gravelly laterite soils (Pilicode).

(b) To investigate the possibility of replacing wood ash with potassic fertilisers (Pilicode).

(c) Comparison of ammonium sulphate and chilean nitrate for manuring the coconut (Pilicode).

(d) Effect of liming coconut soils (all stations).

(2) *Cultural experiments*.—(a) To find out the effect of inter-cultivating coconut gardens by digging compared to ploughing and also to find out the optimum number of ploughings required to get proper yields (Pilicode).

(b) To find out the optimum depth to which the coconut gardens are to be ploughed or cultivated (Pilicode).

(3) *Irrigation trials*.—To find out the optimum interval for flood irrigation during summer months to improve the condition of the poor trees in sandy soils (Nileshwar III).

(4) *Depth of planting experiment*.—To find out the proper depth of planting coconut seedlings in poor sandy soils (Nileshwar III).

(5) *Button shedding*.—Spraying trials with fruit drop inhibiting chemicals to control the button shedding in coconut (Pilicode).

(6) *Coconut breeding (all stations)*.—(a) study of progenies of inter-and intra-varietal crosses already planted will be continued.

(b) Fresh set of progenies of tall X dwarf will be produced and studied.

(c) Progeny studies from selected and known parents of tall and exotic varieties.

(d) Progeny studies of parents known to produce good quality tender nuts.

(e) Study of F₂ progenies of tall X dwarf.

(7) Study of exotic varieties (Pilicode).

(8) Study of preroot formation and establishment of coconut seedlings with one, two and three-year old seedlings (Nileshwar III).

(9) Large scale production and distribution of seedlings of tall X dwarf hybrid, west coast tall and exotic varieties (all stations).

(10) Trial and multiplication of green manure crops and cover crops (all stations).

(11) Trial of fodder grass (all stations).

(12) Production and distribution of fruit plants and vegetable seeds (all stations).

(13) Trial of subsidiary crops in coconut gardens (all stations).

(14) Trials to find out the effect of applying cattle manure to cashew-nut (Nileshwar III).

(17) *The Government Botanic Gardens, Ootacamund (the Nilgiris).*

A. Results achieved during 1952-53.

Ornamental plants.—Several new annual varieties were introduced and tried of which the Engleman's Pacific Giant Pansies proved very outstanding. Bulbs of different varieties of Dahlias, Gladioli and Glocus from Kashmir,

Cyclamen from England, and two species of Liliiums, viz., *Lilium philippinense* and *L. regale* from England were also tried and have been found to take well to this elevation.

2. Economic plants noteworthy among the introductions made are three species of *Eucalyptus alba*; *Eucalyptus derpanophylla* and *Eucalyptus naudiniana* of which *Eucalyptus alba* and *Eucalyptus naudiniana* have recorded satisfactory performance. Besides this, seeds of *Ocimum kalimins* jarium obtained from Forest Research Institute, Dehra Dun, were sown and are under observations.

3. *Studies on annuals*.—(1) Recording of data on the various stages of growth of the different types of annuals that are grown at the Government Botanic Gardens, Ootacamund, from the date of sowing the seeds till they are lifted off the ground was done. As in the past these data have been quite useful for classifying these annuals into different groups according to their duration as early, medium and late, height as short, intermediate and tall and colours. It has also been found useful to make definite suggestions for different types of annual borders, for home and public gardens.

4. *Observations on shrubs and trees*.—Systematic collection of data on the various aspects of growth, flowering, etc., on the numerous trees and shrubs in the garden was continued and recorded.

The records have come in handy to group these shrubs and trees into different categories based on their flowering periods, such as shrubs and trees flowering during (1) spring, (2) summer, (3) autumn and (4) winter. These have been put to use for designing mixed shrubberies, arboretum etc.

5. *Seed viability studies on*.—*Eucalyptus globulus*, *Cupressus macrocarpa torulosa*.

And The date of germination recorded in the three species show that the maximum germination was obtained in.

- (1) Eleven months old seeds on *Eucalyptus Globulus*—91 per cent.
- (2) Ten months old seed of *Cupressus macrocarpa*—54 per cent.
- (3) Thirteen months old seeds of *Cup. torulosa*—26 per cent.

The viability is seen to decrease as the period of storage increases. While *Eucalyptus globulus* and *Cup. macrocarpa* inherently possess good viability, that of *Cup-torulosa* is inherently low.

C. Programme of work for the year 1953-54.

Besides the studies on annuals, shrubs and trees to be continued, new trials like (1) acclimatisation of choice annuals for seed production, (2) pre-treatment of seeds for obtaining maximum germination and (3) propagation of plants by air layering methods are proposed to be taken up.

(18) *Agricultural Research Station Palur (South Arcot district)*.

A. General.

During the year 97,308 lb. of paddy seeds and 14,132 lb. of millet seeds and 704 lb. of sesbania seeds were distributed.

B. Results achieved during 1952-53.

Paddy—(a) *Kar season*.—Eleven Sornavari cultures from Tirukuppam compared against Sornavari strains SW. 7 and TKM 3 have recorded significantly increased yields over SW 7 but were on a par with TKM 3 grown on a bulk scale for seed multiplication and recorded an acre yield of 3,252 lb. grain.

(b) *Samba season*.—Chingleput sirumani strain Co. 19 and blast resistant strains Co. 25 and Co. 26, farm strain PLRI have recorded 3,392 lb., 4,280 lb., 3,252 lb. and 3,252 lb. of grain per acre respectively in spite of the adverse seasonal conditions resulting in inadequate water-supply specially during the flowering and ripening stages of the crop. During the samba second crop (thaladi) season ASD. 5 Karthigai samba second crop recorded an acre yield of 2,730 lb. grain in spite of unfavourable seasonal conditions through its growth period.

(c) *Navarai season*.—Inter strain and inter-varietal trials conducted during the navarai season revealed the following results:—

(i) TKM. 3 gave the highest yield and was on a par with ADT. 18, Co 18 and SW. 1251 while ADT. 16, ADT. 20, Co. 13 and TMK 3 recorded significantly poor yields.

(ii) Vellakar cultures 10115 and 10047 recorded higher yields over Co. 18, Vellakar, Chingleput.

(iii) Mottakar cultures 7521, 10169 and 10178 recorded significantly higher yields over Mottakar standard.

2. *Manurial trials*.—A manurial experiment with P 1 ragi was conducted to find out the relative merits of ammonium sulphate when applied alone and when in combination with lime, farm-yard manure and superphosphate. During May to September season it was found that the response was better at 60 lb. nitrogen than at 40 lb. nitrogen per acre and that too when applied in combination with other manures than when applied alone.

3. *Mixed cropping experiment*.—In a mixed cropping experiment with ragi, groundnut and cotton it was found that growing of groundnut either pure or in combination with ragi and cotton gives heavier returns than growing of ragi or cotton either alone or in combination.

4. *Miscellaneous*.—Varietal studies of tapioca showed that Bassoria was the heavy yielding variety for the locality. Trials with ladysfinger (bendal) showed that V 27 Fyzabadi was the heaviest yielder.

C. Programme of work, 1953-54.

I. *Paddy*.—(1) Variety trials will be laid out during the following three seasons, viz.,

- (a) Kar season (June to September).
- (b) Samba season (July to January).
- (c) Navarai season (December to April).

(2) Seed multiplication of varieties suited to the above three seasons will be carried out.

(3) *Paddy hybridisation*.—Studies of 2 O1 F3 progenies and seven F2 progenies of Japonica x Indica crosses from Cuttack for isolating useful strains suitable to the locality.

(4) Preliminary yield trials of 101 blast resistant progenies of the following crosses :—

PLRI × Co. 19.

PLRI × Co. 4.

Bo 26 × Co. 19.

(5) Study plots of 509 single plant selections from alkaline resistant progenies of the following sets of crosses :—

PTB 15 × T 892

Co. 10 × Bairu vadlu.

Co. 23 × T 892.

Co. 2 × T 892.

DDt. 22 × T 892.

(6) Fine rice strains 1246 and 4388 from Maruteru compared with GEB 24.

(7) Gurmatia × Luchai × Burma cross strain from Madhya Pradesh compared against Co. 13 and Co. 18.

(8) *Manurial experiments*.—(i) To determine the organic matter requirements of soil in the shape of cattle manure, green manure and compost, basal dressing of 45 lb. of nitrogen as ammonium sulphate and 60 lb. of P 202 as superphosphate will be common to all plots.

(ii) Permanent manurials : To find out the direct manurial value of organic manures and inorganic fertilisers and to find out the necessity of liming to paddy soils for correcting acidity.

(iii) Nutrient requirements of paddy : To find out the economic dose of nitrogen and phosphoric acid required for paddy.

(iv) To determine the best method of application of phosphatic manures to rice—Either direct application to paddy or indirect application to the proceeding green manure crop and to determine also the best green manure that responds to this treatment.

Dosage of P 205—45 lb. as superphosphate. All green manure that is obtained in each of the treatments will be ploughed in situ after estimating the quantity.

Green manure crops—Long duration.—Wild indigo and Pillipesara to be sown in January-February.

Short duration—Sunhemp, daincha and Sesbania to be sown in May-June after water is received in the channel.

(v) Green manure experiments—*Sesbania speciosa*—use in the dry farm.

(vi) Increased yield experiments.

II. *Ragi*.—Two season—May to September and December to March as seed multiplication of P1, AKP1 and AKP7 ragi.—

(a) Varietal trial—Pure line selection from ryots unselected bulk seed to obtain a better strain than P1 ragi.

(b) Manurial—Chilian nitrate trials on ragi.

(2) Mixed cropping trials with ragi, groundnut and cotton.

III. *Varagu*.—Seed multiplication of varagu strain P1.

IV. *Groundnut*.—(1) Yield trial Four selections of irrigated groundnut AH 441, AH 4218, AH 4515, AH 6431 and TMV 2 standard.

(2) Growing of TMV 2 in rice fallows.

(3) Seed multiplication of TMV 4.

V. *Cotton*.—(1) Mixed cropping trials.

(2) Growing of P216F in Rice fallows.

VI. *Redgram*.—Growing of strain No. c 37 as mixed crop with varagu as a dry crop.

VII. *Gingelly*.—Seed multiplication of TMV 3 in garden land.

VIII. *Tapioca*.—(1) Multiplication of "Valanca".

(2) Yield trials of varieties from Travancore.

Vellarotti

Rotti Kappa.

Elamuriyan.

Neelum.

Kumkoil Vellai.

Local.

IX. *Sweet potato*.—Varietal study of 14 varieties received from Bapatla and 8 received from the paddy specialist, Coimbatore.

X. *Vegetables*.—(1) Seed production in brinjals, cluster beans, cowpea, lablab, tomato and ladyfinger.

(2) Varietal trials of ladyfinger varieties and isolation and seed multiplication of promising types.

XI. *Fruits*.—(1) *Banana*.—Varietal study to select types suitable to the locality.

(2) Raising seedlings and plants of jack, mango, guava, sapota, lemon, etc., from seed, by grafting and by layering.

XII. *Fodder crops*.—

(1) Thin napier grass.

(2) Guinea grass.

(3) Buffalo grass.

(4) Hybrid of Cumbu X Elephant grass.

XIII. *Green manure*.—Seed production of daincha and Sesbania speciosa.

XIV. Maintenance of Rhode Island Red breed.

(19) *Agricultural Research Station, Pattambi (Malabar district)*.

A. General.

Pure seeds of 30 improved strains of paddy were multiplied and distributed to the extent of 195,166 lb.

B. Results achieved during 1952-53.

1. *Pureline selection*.—High yielding cultures selected from Elapa Poochampan 7391 and Aruvakkarai and 7,560 were released as PTB 31 and PTB 32 respectively.

2. *Hybridisation*.—Five progenies selected from inter strain crosses of first crop were compared against parents. One was very promising giving 73.8 per cent increased yield over the standard.

3. *Manurial experiment*.—In combined organic In-organic Nitrogen experiment, analysis of 4 seasons results showed that a combination of 1/3 Groundnut cake and 2/3 Ammonium sulphate gave the highest yield of 24.6 per cent increase over no manure.

In the experiment with graded doses of green leaves and super two years combined results on analysis showed that leaves at 6,000 lb. and super to supply 60 lb. P_2O_5 per acre recorded the highest yield of 32.0 per cent increase over no manure.

Trial of intensive manuring of second crop paddy and the study of its influence on the yield of succeeding broadcast crop in the first season were continued. It is found that cattle manure at 10 tons per acre recorded 13.9 per cent increased yield over no manure.

Indirect manuring of paddy with phosphates supplied to preceding leguminous crops was continued in a modified form. Daincha sown with 80 lb. P_2O_5 gave 183.1 per cent increased yield of green matter over green manure with no phosphate and the highest yield for paddy was recorded in the same treatment giving an increased yield of 42.0 per cent over green manure with no phosphate.

In the Di-calcium phosphate trials, groundnut cake to supply 40 lb. N with super to supply 80 lb. P_2O_5 applied by placement recorded the highest yield of paddy giving 17 per cent increase over no manure. In the second crop, Di-calcium phosphate applied by broadcasting recorded 63.8 per cent increase over no manure.

In the studies on laterite soils incremental doses of lime, leaf and phosphoric acid contributed to higher yields. Leaves at 7,500 lb., super to supply 60 lb. P_2O_5 and lime at 3,000 lb. per acre recorded the maximum yield giving 204.8 per cent increase over no manure.

Calcium Carbonate Slurry was compared with slaked lime on application to paddy at 1 ton, 2 tons and 3 tons per acre over a basal dressing of 500 lb. green leaf. Lime at 3 tons gave 17.0 per cent yield over slurry at 3 tons.

4. *Cultural experiments.*—Study on the effect of different insecticides on the incidence of pests and diseases was continued. In the case of treatment of seedlings with insecticides against stem-borer spraying with B.H.C. 0.1 per cent recorded the minimum infestation with maximum yield giving 48.8 per cent increased yield over control.

D. D. T. and B. H. O. at different strengths were dusted on paddy to study their effect on Kodu. Dusting with D. D. T. 5 per cent gave 24.9 per cent increased yield over control in the first crop and 5.7 per cent in the second crop.

5. *Other studies.*—The study on the fluctuation in the weight and germination of paddy strains in bulk storage was continued. During the monsoon period all the second crop varieties stored during April 1952 showed a steady increase in weight ranging from 0.25 per cent to 3.0 per cent. From January onwards an average of 2.0 per cent loss in weight was noted.

Viability was almost constant for several months up to September except for PTB. 10, which recorded a germination percentage of 90 in August and only 36.5 in September and less and less in the succeeding months.

Studies on the depth of colour in rice foliage showed on association of light green with better tillering for the light green culture under study while the dark green culture had longer earheads.

6. *Varietal trials on tapioca and sweet potato.*—These trials were continued during the year of the 18 varieties of tapioca compared for yield, variety Kayalachadi recorded the maximum yield of 12,210 lb. per acre. Variety V 2 in sweet potato gave the maximum yield of 13,008 lb. per acre among the varieties put under comparative trials.

C. Programme of work for 1953-54.

1. *Improvement of local varieties.*—Pure seeds of 32 improved strains of paddy will be multiplied and distributed. High yielding culture in Arikkirai 6,027 will be released as a strain. Promising cultures in Chornali, Velutharikayama, Valiachampan and Vellakoli will be put under further yield trials. Preliminary trials will be taken up in the varieties Vadakkan (Cannanore), Vadakkan (Tellicherry), Valiachorali, Cheria chornali vella cheera of Palghat Taluk, Alli Kannan (Cannanore), Annachampan, Veluthari Kayama White Rice and Mundaga kutty.

2. *Hybridisation.*—Crosses will be made between suitable strains for evolving non-lodging first crop strains and for inducing dormancy in the existing strains of PTB. 9 and PTB. 10. Promising progenies selected from inter strain crosses will be studied. The performance of the hybrid culture of C 0.3 × PTB. 19 will be further studied.

3. *Manurial experiments.*—Four experiments are laid out under the co-ordinated Manurial experiments, viz., (1) to study the organic matter requirements of soil, (2) Permanent manurials, (3) nutrient requirements of paddy, (4) indirect manuring of paddy with phosphates supplied to preceding leguminous green manure crops. Besides trials will also be continued to find out the efficacy of Chilean Nitrate over Ammonium sulphate when applied to paddy crop, Calcium Carbonate Slurry over slaked lime; and Dicalcium phosphate over superphosphate. Studies on the reaction of laterite soils to heavy applications of lime and phosphates under placement will also be continued.

4. *Cultural experiment.*—Trial is being laid out to compare the Japanese method of cultivation with the Farm Method.

5. *Other studies.*—Husking Test of strains will be taken up. Manurial experiment on Tapioca to find out the effect of different ingredients under rainfed conditions will also be laid out.

(20) Agricultural Research Station, Pattukottai (Tanjore district).

Results achieved during 1952-53.

1. *Kurvai Strains.—Varietal trials.*—Five short duration varieties and six long duration varieties of almost of uniform duration were compared in replicated trial plots of $\frac{1}{2}$ cent each for the second year. ADT. 20 among the short duration varieties and ADT. 16 among the long duration varieties were found to be the best.

2. *Samba varietal trials.*—Among the short duration varieties ADT. 8 was found to be the best and Co. 25 among the long duration varieties gave the best results.

3. *Ragi.*—Four varieties of ragi, viz., AKP. 1, PLR. 1, Co. 2 and Co. 3 were tried under observation plots in July, August in garden lands and AKP. 1, gave the maximum yield.

4. *Groundnut varietal trials.—TMV. 2 Bulk.*—This was raised in an area of 1.50 acres in dry lands with a mixture of redgram and sunnhemp and as a pure crop in rice fallows in 5.25 acres. In dry lands the crop gave an average yield of 3,400 lb. and in wet lands gave 1,220 lb. per acre.

5. *Tapioca.*—Five selected short duration varieties of tapioca were tried in rice fallows in summer and the crop was a failure due to rainless condition in May. Among the long duration varieties Valenca and Butterstick gave good yields.

6. *Cotton*.—Five acres were raised under P 216 F cotton in rice fallows during the year. The crop gave an average of 310 lb. per acre due to drought in the later stages of the crop.

An observation plot was laid in which the following treatments were given in 5 cent plots :

- (1) 10 tons of Farm yard manure per acre ;
- (2) 224 lb. of Ammonium sulphate per acre ;
- (3) 224 lb. of Ammonium sulphate plus 45 lb. of P_2O_5 ;
- (4) 45 lb. of P_2O_5 only.

The crop manured with farmyard manure gave the maximum yield.

7. *Green manures*.—Sesbania, Daincha and Sunnhemp were raised in rice fallows after the harvest of paddy in an area of 7.13 acres during the year. Sesbania plants were planted all along the Kuruvai field and gave an acre yield of 3,000 lb. per acre. Thus the total yield of green manure along with leaves obtained from Gliricidia on bunds could be quite enough for manuring paddy crops at the station.

Programme of work for 1953-54.

Paddy varietal trials.—As in the case of the previous year short and long duration varieties of kuruvai and samba of almost uniform duration will be compared during the year.

Manurial experiment.—As suggested by the Headquarters Deputy Director of Agriculture and also by the Government Agricultural Chemist a manurial experiment is proposed to be conducted in this station. The object of the experiment is to find out the optimum for various kinds of manures including lime to give the maximum yield both in Samba and Kuruvai.

TMV. 2 Groundnut.—This is proposed to be multiplied both in dry lands and in rice fallows.

TMV. 3 Castor.—The seeds will be sown on field bunds in dry lands and also in waste places.

Redgram—Culture 37.—This is proposed to be sown as a mixture with TMV. 2.

Tapioca.—Butterstick and Valencia among the long duration varieties of tapioca have been proposed to be raised and a manurial experiment is proposed to be conducted for the same.

Green manures.—Sesbania, Daincha and Sunnhemp have been proposed to be raised in rice fallows in summer. Sesbania seedlings will be planted all along Kuruvai and Samba field bunds for production of green manure and seeds respectively.

Cotton.—Manurial trials will be conducted in P216F cotton in rice fallows as per instructions of the Deputy Director of Agriculture, Tanjore.

Vegetable and fruit plants.—Vegetable crops like snakegourd, bittergourd and brinjals will be cultivated in large areas for production of seeds only. Aligarh variety of brinjal seed will be tried once again this year. As per instructions of the Director of Agriculture, potatoes will be tried at this station. Cuttings and seedlings of fruit plants will be raised in large number for sale to the public. Mango seedlings have been proposed to be grafted during the year.

Miscellaneous.—Cover crops, viz., *Calopogonium* and *Centrosema* will be tried for second time at this station. Paddy seedlings will be planted under Japanese method of cultivation during this year.

(21) Deep Water Rice Station, Pulla (West Godavari district).

A. Results achieved during 1952-53.

1. *Pure line selections and introduction of varieties*.—T. 2205 variety from Assam, Burma, Akkulu, AR. 101-1 against an Assam variety were found to be as good in yield this year also, when no floods were received. T. 2208 was found to be very tall growing and non-lodging. T. 2207 and T. 2206 were also found useful. For the second crop season PLR. 2. TKM. 3 and a cross progeny between Nallarluru and Kasipichodi were found suitable.

2. *Hybridisation*.—Crosses were effected between the Assam type T. 2205 which was found useful for cultivation in the lake area and the local strains MTU. 1, MTU. 4, MTU. 19 and GEB. 24 for the first crop season and MTU. 9, MTU. 15, S. 10-16 × Nallarluru, N × 60 and 11134 for the second crop season.

Green Manure.—Glyricidia and Sesbania speciosa seedlings were planted in the area. One pound of Glyricidia seed and 56 lb. of Sesbania seed were obtained from the plants.

B. Programme of work for 1953-54.

Paddy—First crop.—(i) Study of varieties to find out their capacity to withstand submersion to different depths of water in June-December season. Arranging trials in the neighbourhood with promising cultures and varieties.

(ii) Isolation of pure lines from varieties, reputed to withstand submersion.

(iii) Continuation of the study of cross progenies between deep water varieties and local strains.

(iv) Study of the crosses made between the deep water rices of Assam and promising strains to introduce flood resistance in the local strains.

Second crop.—(i) Continuation of the study for making selections in Nallarluru which is a common variety in the Collair tract.

(ii) Study of short duration strains and their yield trial in second crop season to find out their suitability for early harvest to escape water shortage.

(iii) Continuation of the study of the cross progenies between short duration strains for evolution of a high yielding quality rice of short duration suitable for Dalwa area.

(iv) Study of cross between the short duration strains.

(22) Agricultural Research Station, Samalkota (East Godavari district).

A. General.

A total quantity of 59,435 lb. of paddy seed was distributed from this station to the districts. About 17,744 selected coconut seedlings were supplied and a fresh batch of 35,915 nuts sown during the year.

B. Results achieved during 1952-53.

1. *First crop paddy—Comparative yield trials of Basangi Krishna katukulu cultures—Second year trial.*—These cultures were grouped into three series, two of which were compared for yield with SLO. 9 and MTU. 9 as standards and the other with SLO. 15.

The stand of the crop of MTU. 3 in both the series was significantly outstanding.

In the third series Basangi Kristna Katukulu culture Nos. G.T. 5 G.T. 9, and G.T. 10 (which were characterised as green throughout) were compared for yield with SLO. 15, G.T. 10 and G.T. 9 recorded higher yields than the control.

2. *Comparative yield trials of MTU. 5 × 10 cross progenies.*—This is the second year of trial. The three cultures Nos. 10186, 10175 and 10199 were compared for yield with the parents MTU. 5 and 10 and SLO. 15. Culture No. 10199 recorded the highest yield of 4235 lb. of grain per acre followed by culture No. 10175.

3. *Comparative yield trial of MTU. 19 × SLO. 17 and SLO. 18—Cross progenies.*—This is the second year of trial. The five cultures which were found promising were carried forward for trial during the year under report and compared with MTU. 19, SLO. 17 and 18. Nos. 10235 and 9990 were statistically superior to SLO. 18. The rest of the cultures under study were on a par with MTU. 19. and SLO. 17.

4. *Manurial trials.*—(a) The effect of application of 30 lb. n. 45 n. and 60 n. with and without combination of 30 lb. P_2O_5 , 45 lb. P_2O_5 and 60 lb. P_2O_5 was sought to be compared with SLO. 13 as the variety. It is observed that higher doses of nitrogen depressed the yield by prolonging the vegetative growth. Phosphoric acid alone did not have any effect on the yield.

(b) Permanent manurial experiments on paddy to find out the effect of optimum requirements of plant food materials of nitrogen, phosphoric acid, potash, and lime. This was the first year of trial.

Application of the organic and inorganic fertilizers with combination of potash and lime recorded the highest yields.

(c) *Observation trials with Sesbania in green and dry forms.*—Application of Sesbania fresh and completely dried and covered with earth were found to record the best yields.

5. *Sugarcane.*—The influence of weather on the crop growth, incidence of pests and disease, maturity and yield in Co. 419 was studied in the co-ordinated crop weather study experiment. It gave an acre yield of 45 tons as against 23 tons of last year.

Cotton in rice fallows.—Cotton was sown in two series in rice fallows.—

(1) Sowing was done within three days after the harvest of paddy (main crop) sown on 26th October 1952.

(2) Sowing was done on prepared land by ploughing (5 and 6 times) sown on 2nd January 1953.

In series I Madras Uganda-1, Madras Uganda-2 and P. 216 F. were sown. In series II in addition to the above three P23F was also included and sown.

It is seen that sowing in series I is more advantageous than sowing in series II and that Madras Uganda-1 followed 216F are the best varieties for yield of Kapas. Their acre yields were 873 and 759 lb. respectively.

(23) *Agricultural Research Station, Siruguppa, (Bellary district).*

A. General.

A total quantity of 16,659 lb. of paddy seeds, 26,676 lb. of jonna seeds and 1,036 lb. of korra seeds were distributed through the District Staff.

B. Results achieved in research during 1952-53.

Chemical investigation on the effect of light and heavy irrigation on the black soils was continued and it was found that no salts rise to the surface soil. This finding is in conformity with the results of previous years. So no alkalinity will develop as a result of irrigation in black soils of Tungabhadra Project.

Analysis of drainage water from paddy lands during crop growth clearly show the presence of alkali salts, thereby showing that the alkali or injurious salts are moving down in drainage water.

As in previous years, this year too paddy varieties AKP. 2 and GEB. 24 had recorded maximum yield of 4,006 lb. and 4,592 lb. respectively and these two strains are recommended to the project in June-December season. AKP. 2. matures earlier than GEB. 24 by about 2 weeks, and is recommended in areas where sugarcane is to be rotated with paddy, as this gives ample time to get the land prepared for next sugarcane crop planting in February-March.

For late planting in September-February season, Co. 2, ASD. 5., ADT. 18, MTU. 15, were found to give good performance and recommended to the project. The first two strains are longer duration types while the remaining two are of short duration. Late season planting at fortnightly intervals in September and October, had revealed, that planting of paddy by second fortnight of September had given higher yields than plantings of paddy in October. It is advisable in the project area, not to delay planting of paddy beyond 1st week of October for late season or cold weather crop.

For summer February-May season, paddy varieties Co. 13, ADT. 18 and MTU. 15 had given good yields of 2,996, 3,013, and 3,366 lb. per acre respectively. Co. 13 matures earlier than the other two by about two weeks. Ayacutdars of the project can grow any of these strains.

Among the six redgram varieties tried, No. 72 had recorded the highest yield of 492 lb. per acre.

In groundnuts A.H. 4111 (bunch type) and TMV. 4 (spreading type) had recorded highest yield of 1,450 and 876 lb. per acre respectively.

Groundnut when sown after treating with bacterial inoculum had given an acre yield of 1,046 lb. than non-treated seed which gave 720 lb. per acre. It is advisable to treat the seed with bacterial inoculum prior to sowing.

Out of three gingelly strains tried, TMV. 2 had given highest yield of 320 lb. per acre. This variety is recommended to the ayacut, as it recorded highest yield during last season also.

Castor variety TMV. 2 gave the maximum yield of 500 lb. per acre and recommended to the ryots.

Linseed variety I.P.I. 6 gave the highest yield of 500 lb. per acre.

Five varieties of sugarcane were allowed to ratoon and for the first ratoon crop. Variety Co. 449 gave the maximum yield of 28.4 tons of cane per acre.

Five varieties of sweet potato were compared with local and I.B. 22 gave the maximum yield of 10,079 lb. of tubers per acre.

Paddy GEB. 24 yielded well when ammonium sulphate was applied two to three inches below the surface as in Japan. This method gave an acre yield of 5,060 lb. paddy per acre. Top dressing of paddy with ammonium sulphate 30 days after planting, resulted in recording an acre yield of 4,480 lb. of grain.

Phosphate experiments clearly indicate that paddy crop responds to 40 lb. N. 180 lb. P. Control (i.e.,) no manure and N. alone had given poor yields. The three treatments control, N and N+P had given 1,348, 2,276 lb. and 2,899 lb. of paddy per acre respectively.

Inorganic nitrogen in the form of ammonium sulphate at 150 lb. per acre was compared with a mixture of organic plus inorganic N in the ratio of 1:1 over a basal dressing of 5,000 lb. green leaf plus 168 lb. super per acre, on paddy crop. So long as the total nitrogen applied was the same, there was no statistical difference between the kinds of nitrogen. In the experiment organic nitrogen was given in the form of groundnut cake. Thus the results indicate that groundnut cake which is costly can be eliminated while manuring paddy and entire N can be given in the form of ammonium sulphate which is cheaper in the market.

Manurial experiment of korra which is the staple food crop of the tract, show that the crop responds well to 40 and 60 lb. N per acre. Phosphates seem to have no effect on korra crop. Manured plots gave 22 per cent higher yield than control.

In the green manure experiments conducted on Cambodia cotton, it was found that increased yields of kapas were obtained with the increased dose of green manure. No manure in control plot gave 322 lb. kapas per acre; while the plot where green manure crop of dhaincha was grown and ploughed in, prior to cotton, gave 1,066 lb. kapas per acre.

The time-honoured practice of adopting the higher seed rate of 15 to 20 lb. per acre for late or Hingari Jonna was found to solve the problem of fly attack to an extent.

Insecticide like BHC, when sprayed, reduces the percentage fly maggot attack on cholam crop.

Entomological trials conducted revealed that aphids and jassids on cotton crop; thrips on onion can be well controlled by spraying with BHC.

Chillies, maize, glumed wheat, big onions, tomato, brinjal, bendai, papaya, and pomegranates had given good yields. These can be grown successfully in the ayacut.

Cambodia Cotton Lakshmi had given the highest yield of 1,450 lb. per acre; while M.A. 2 and H.A. 11 recorded low acre yield of 988 and 1,340 lb. kapas respectively. Lakshmi is recommended for the project.

Total quantity of 56,965 lb. of improved seeds multiplied on the farm, was distributed to ryots through District staff.

The value of green manure crops of *sesbania speciosa* and *Glyricidia maculata* was well demonstrated to the ryots by growing them on fringes of field bunds in wet lands and on road sides on the farm.

Farmers' day was celebrated twice in the year during September and February, when ryots of the area visited the farm. An exhibition was also arranged on the occasion.

Bhagawadi demonstration farm.—The ryots of Bhagawadi farm adopted the improved methods to raise crops successfully under irrigation with the departmental strains on the lines advocated at Agricultural Research Station, Siruguppa. The layout of the fields into beds and channels with bund former, for easy and economical irrigation, the method and application of chemical manures to crops, earthing up of cotton with ridge ploughs and preservation of cattle manure properly were demonstrated to the ryots and they followed promptly. One experiment on Cambodia cotton under observation was conducted with the varieties M.A. 2 and Lakshmi which gave the performance of 612 lb. of kapas and 582 lb. of kapas per acre respectively. The results of important crops raised are given below:—

- (1) Paddy, GEB. 24—2,889 acre yield in lb.
- (2) Jonna Co. 9—625 acre yield in lb.
- (3) Korra N. 1—690 acre yield in lb.
- (4) Cambodia cotton—Lakshmi 912 acre yield in lb.
- (5) Glumed wheat—750 acre yield in lb.

C. Programme of work for the year 1953-54.—

Fundamental studies on the Physico-Chemical reaction of black soil to light and heavy irrigations to be continued.

2. The study on the effect of the fertility of the deep dry irrigated black soils to irrigations to be continued.

3. Green manure experiment to assess the optimum dose of green manure for black soils with dhaincha to be continued.

4. Soil moisture studies to be continued.

5. Trial of super phosphate on paddy in single crop paddy is to be continued.

6. One trial of super phosphate and rock phosphate (Kotka phosphate) on paddy crop is newly included.

7. Japanese method of application of ammonium sulphate to paddy crop is to be continued.

8. *Manurial experiment on cotton.*—The study of the use of ammonium sulphate in alkaline soils will be continued under the control of Assistant Cotton Specialist, Siruguppa.

9. Manurial experiment on korra with 0, 10, 20, lb. P each in combination with 20, 40, and 60 lb. nitrogen to be continued.

The following varietal trial will be continued:—

- (1) *Redgram*—Variety Udgir, Jagudam, H, 39, 72, 37, 2,900.
- (2) *Groundnut bunch.*—Varieties local, TMV. 2, AH. 4,218, AH. 4,515, AH. 4111.

(3) *Groundnut spreading.*—Varieties local, TMV. 1, TMV. 3, TMV. 4, AH. 334, and AH. 4,354.

(4) *Late season paddy.*—Short duration paddy strains ADT. 18, MTU. 15, in two series at fortnightly intervals and long duration paddy varieties Co. 2, ASD. 5.

(5) *Double crop area.*—February-May season varieties ADT. 18, MTU. 15, Co. 13, Co. 20, TKM. 4.

(6) *Sweet potato varieties.*—Local Jersey, big stem, I.B. 22, I.B. 24, I.B. 33, I.B. 5,941.

(7) *Linseed*—Varieties I.P.I. 6, I.P.I. 11, I.P.I. 65, I.P.I. 68, and K2.

Cultural trials—(1) *Rotational trials*.—Four year and three-year course rotation trials to be continued both in shallow and deep soils in randomized plots replicated six times.

(2) *Mixed cropping trials*.—Cotton in chillies; cotton in onions; cotton in groundnut; cotton in korra.

Pure crop of chillies, onions, groundnut, korra.

Entomological experiments—(1) Four experiments namely, flooding trial, manurial trial, insecticidal trial, cultural trial on Hingari Jonna to find out the control measure of cholam fly to be continued.

(2) Three experiments on cotton to find out the control measure of aphids, jassids and boll worms of cotton to be continued.

(3) Control of onion thrips to be continued.

(24) *Agricultural Research Station, Taliparamba (Malabar district)*.

A. General.

A total quantity of 11,585 lb. of paddy seeds were distributed during the year, out of 12,981 lb. produced from an area of 5.91 acres of wet lands.

B. Results achieved during 1952-53.

1. *Paddy*.—From the results of the comparative yield trials with different varieties and strains, the Pattambi strains PTB. 9 and PTB. 13 were found superior in yield to the other strains and local varieties.

2. *Chilli*.—From the comparative trial of chilli types, South Malabar and Guntur types were found to be more promising than South Kanara and Pusa. Among eight fungicides put under trial to control fruit rot of chilli, Bordeaux mixture and copper sandoz were found to be far superior to the other chemicals.

3. *Fruits*.—From the rootstock trial of sapota, initiated in 1951, it has already been found that sapotas grafted on *Bassia longifolia* develop incompatible joint.

Application of alpha-naphthalene acetic acid in the form of 'Planofix' in concentrations of 0.05 per cent, 0.01 per cent and 0.1 per cent of alpha-naphthalene acetic acid to the growing points of the plants was found to hasten fruiting.

4. *Pepper*.—The season was very unfavourable for pepper in general. There was severe spike shedding and pollu incidence. The yield of pepper during the year was 615 lb. dry pepper, 120½ lb. inferior pepper, 125 lb. of pollu and 25 lb. of varagu.

From data in respect of pollu incidence, it was found that the incidence manifests early in October and increases as the season advances. Dense shade was found to be conducive to increased incidence of pollu and the Travancore varieties were found to be more susceptible to pollu incidence than the local varieties of Kalluvally and Balankotta. Kalluvally was found to be the least susceptible.

5. *Coconuts*.—The yield of coconuts during the year was 8,932 lb. as against 5,080 in the previous year. The trees were not manured during the year. Due to the very severe drought, the trees have been adversely affected.

6. *Arecanut*.—The yield of nuts during the year was 129,070 as against 103,283 nuts during the previous year. The severe drought during the year had adversely affected the trees.

7. *Green manure crops*.—It has been found that for seed purpose *Sesbania speciosa* should be sown in August-September so that the pods mature during the dry and bright season.

C. Programme of work for 1953-54.

I. *Paddy*.—(1) Comparative yield trial of different strains of paddy to determine the most suitable first crop strain for popularisation in this tract and to confirm the previous findings.

(2) Pure line selection is *kurmakayama* to evolve high yielding strain of *kurmakayama*, one of the most important first crop varieties in Chirakkal taluk.

(3) Hybridization between strains PTB. 9 and PTB. 13 and MTU. 3 and MTU. 4 to evolve a non-lodging and high yielding strain for the first crop.

(4) Manurial trial on paddy to find out how far the application of ammonium sulphate in conjunction with green leaf and superphosphate in one year will affect the yield in the subsequent year, if in the subsequent year, ammonium sulphate is not applied to the field.

(5) Trial on the application of ammonium sulphate to paddy fields for a number of years, to find out if application of ammonium sulphate consecutively for a number of years will result in poor yield of paddy in later years.

II. *Chilli*.—Comparative yield trial of different types of chilli to test the comparative merits of the Guntur types against the local type.

III. *Pepper*.—(1) Trial on top working of *Uthirankotta* vines with *Balan-kotta* vines and *Kalluvally* to find out of the productivity of *Uthirankotta* can be increased.

(2) Trial of DDT. and BHC. to control the incidence of insect *Pollu* of pepper.

(3) Trial of Bordeaux mixture for controlling the fungus *Pollu* of pepper.

(4) Studies on the incidence of *Pollu* of pepper in relation to shade.

(5) Studies on the pollination of pepper with a view to determine the role of rain in the pollination of pepper.

(6) Study of the difference in sexuality of the spikes of pepper in relation to shade.

IV. *Tapioca*.—(1) Introduction and comparative yield trial of tapioca, Hybrid 105 Valencia.

(2) Monthly planting trial of Valencia to determine the variation in yield in relation to season of planting.

V. *Groundnut*.—Trial of groundnut in rotation with paddy in single crop wet lands to work out the economic of such rotation with reference to the groundnut crop and the return for the succeeding paddy crop.

VI. *Pineapple*.—(1) Trial on the effect of alpha-naphthalene acetic acid in extending the fruiting season of pineapple, and to determine the optimum concentrations of the hormones for hastening and delaying the fruiting of pineapple.

(2) Varietal trial of pineapple to determine the most profitable variety for cultivation.

(3) Evolving new types of pineapple by selection of chance budsports.

(4) Trial on the growing of pineapple with and without a mulch of leaves, in relation to the economics of cultivation.

VII. *Sapota*.—Rootstock trial of sapota which was initiated in 1951 will be continued.

VIII. *Jack*.—A rootstock trial of jack with *Artocarpus hirsuta* and jack seedling as rootstocks will be initiated.

(2) Blossom biological studies on jack will be undertaken with a view to evolve a technique for hybridization and to see if seed progenies true to the female parent can be raised by self-pollination or if seed progenies combining the characters of two desirable parent trees can be secured by controlled cross pollination.

(25) *Agricultural Research Station, Tindivanam (South Arcot district)*.

A. General.

For the sixth year in succession the rainfall was subnormal. A total quantity of 41,831 lb. of groundnut seed pods, 1,313 lb. of gingelly seeds and 984 lb. of castor seeds were distributed during the year.

B. Results achieved during 1952-53.

1. *Groundnut*.—Of the eight spreading selections under comparative yield tests two from progenies of crosses and two from local groundnut have shown good performance. Seven big seeded selections under trial have out yielded the local and are on a par with the improved strains. Fourteen of the seventeen big seeded types have yielded better than the control in preliminary yield tests. Sixteen new crosses were attempted and fifty-six single plant selections were isolated from progenies of earlier crosses under study. In the manurial experiments cattle manure in combination with K_2O_5 and P_2O_5 has beneficially affected yields. Ploughing four times with iron plough and six times with country plough have shown significant increase in yield as compared with lesser number of ploughings in the cultural experiment. *Cholam* following groundnut recorded higher yields than *Cholam* following *Cholam*. TMV. 2 extract was found to have better effect in breaking the dormancy of spreading groundnut than a few chemicals tried.

In the irrigated season mixture, cropping of groundnut, *Ragi* and cotton was found to be more remunerative than the existing practice of groundnut *Ragi* mixture. Irrigating groundnuts at intervals of 15 days was found more economical as compared with irrigating at intervals of ten, twenty and twenty-five days.

2. *Gingelly*—1952 *Summer*.—Of the four colour grades of TMV. 1 strain the black and brown seeded types out-yielded the local. In a spacing experiment the treatment 1' x 1 ft. recorded significantly higher yields and this is in conformity with earlier findings. A study of the deterioration of gingelly seeds under storage in different containers was started and minimum deterioration was noticed in samples stored in glass bottles and maximum in mud-pots.

3. *Gingelly*—1952-53 *cold weather*.—One of the three selections under preliminary yield trials gave significant increase in yield. One out of thirteen selections under replicated row tests and twenty-two out of forty-five selections under row tests out-yielded the controls and have been advanced to

the next stage of trials. In the spacing experiment plants spaced 9 inches either way recorded highest yields. Two fresh crosses were effected during the season.

4. *Castor*.—Three selections have recorded high yields consistently during the three seasons of trial. Four new crosses were made and progenies of earlier crosses were raised, for detailed study. Dusting with BHC in the earlier stages and spraying with DDT in the later stages were found effective against the semi-looper pest. TMV. 1 strain exhibited a high degree of resistance to the pest.

5. *Scheme for large scale trials with insecticides and fungicides on groundnut*.—The results have conclusively shown that dusting DDT. 5 per cent for the control of *surul* pest on groundnut and spraying Bordeaux Mixture 3/4 per cent or dusting sulphur to control *tikka* leaf spot disease are effective as well economical.

C. Programme of work for 1953-54.

A. *Groundnut*—(i) *Rainfed season*.—(1) Comparative yield trials of three bunch and two spreading strains from other states.

(2) Comparative yield trials of seventeen spreading selections.

(3) Preliminary yield trials of seven bunch and eight spreading selections.

(4) Seed Multiplication of four bunch and eighteen spreading selections.

(5) Replicated row tests of thirty bunch and thirty-three spreading selections.

(6) Row tests of three hundred and twelve selections.

(7) Study of eighty-seven new varieties and types.

(8) Hybridization.

(9) Manurial experiment.

(10) Cultural experiment.

(11) Rotation experiment.

(12) Groundnut-cotton mixed cropping experiment.

(13) Breaking dormancy of groundnut.

(14) Harvesting and curing trials.

(15) Maintenance of varieties and types.

(16) Rainfall and yield correlation experiment.

(17) Mechanical cultivation of groundnut.

(18) Trial of labour saving implements.

(19) District trials.

(ii) *Summer season*.—(1) Comparative yield trials of sixteen selections.

(2) Mixed cropping experiment—*Ragi*, groundnut and cotton.

(3) Irrigation experiment.

(4) Spacing trials.

B. *Gingelly*—(i) 1953-*Cold weather season*.—(1) Preliminary yield trial of three selections.

(2) Seed multiplication of selections.

(3) Replicated row tests—Twenty-two selections.

(4) Hybridization.

(ii) 1953-*Summer season*.—(1) Comparative yield trials of six selections.

(2) Preliminary yield trials of six selections.

(3) Seed multiplication of twenty selections.

(4) Replicated row tests of thirty-five selections.

- (5) Hybridization.
- (6) Spacing trials.
- (7) Seed multiplication of varieties and types.
- (8) District trials.

- C. Castor.*—(1) Comparative yield trials of three strains from other States.
- (2) Comparative yield trials of eight selections.
 - (3) Preliminary yield trials of six selections.
 - (4) Replicated row tests of thirty-two selections.
 - (5) Purity studies—Seventy selections.
 - (6) Hybridisation.
 - (7) Maintenance of inbred types.
 - (8) Maintenance of purity and vigour of strains.
 - (9) Multiplication of strains and types.
 - (10) District trials.

(26) *Rice Research Station, Tirurkuppam.*

A. General.

A total quantity of 34,159 lb. of paddy seeds were distributed from the station during the year.

B. Results achieved during 1952-53.

1. *Pure line selection.*—One strain TKM 6 was released during the year. Three hundred single plants were selected from Bairuvadlu for comparison against the ryots' bulk. Ten cultures in Vadan samba and five in Kaligan samba were under yield trials against ADT 22. Seven cultures in Sornavari, 5 cultures in Seevan samba, 5 in Kittan samba, 9 in Sirumani, 60 in Chinna samba, 6 in Kappakar, 6 in Pullasannavadlu and 27 in Mottakar were carried forward for trial against their respective standards. None cultures in Sathikam, 3 in Chittida and 9 in Kesari have been fixed up for yield trials against Co. 13.

2. *Hybridization.*—The promising season and period bound progenies have been fixed for final yield trials. Four hundred and one progenies of crosses including 118 Japonica × Indica parents have been selected for further study. Artificial crosses have been effected between Sornavari and samba paddies and seed gathered. In the group of rainfed varieties, crosses were effected between TKM. 2 and BAM. 3, MTU. 4 and TKM. 1, TKM. 2 and Bairuvadlu with wild varieties. One hundred and eighty-one single plant selections were selected for further study. For the semi-dry group 264 selections were made from crosses made for the purpose.

3. *Manurial experiments.*—Green manuring trials in wet paddy resulted in an increase of 46.1 per cent increase from the plots treated with green manure. Phosphates applied directly to paddy and indirectly through green manure were on a par. Dicalcium phosphate and super applied on surface were on par with the manure 'placed'. Sesbania planted 2 inches to 3 inches spaced along the fringes of rice fields gave the maximum yield.

In the mixed cropping trials with Madras Uganda I and TKM. 2 Paddy strain, the latter failed and cotton gave 327 lb. kapas per acre.

C. Programme of work for 1953-54.

I. *Pure line selections.*—(i) Multiplication of strains in Chingleput, North Arcot and Chittoor districts

(ii) *Improvement of rainfed varieties.*—Three promising cultures in Sem-balai and 38 in Mottakar will be under yield trials against TKM. 2. Three

hundred single plant selections in Bairuvadlu will be under observation. Selection work will be taken up in Sonappalai, a short duration variety.

(iii) *Semi-dry varieties.*—Ten cultures in Vadan samba, and five in Kaligan samba will be under yield trials against ADT. 22 and 24 Vadan samba cultures from Sulturpet will be under preliminary yield trials and selection work will be started afresh in Kappa samba.

(iv) *Wet area.*—Seven cultures in Sornavari will be under yield trial. Five cultures in Seevan samba, 5 in Kittan samba, 9 in Sirumani, 60 in Chinna samba, 6 in Kappakar, 6 in Pullasannavadlu and 27 in Mottakar will be under yield trials. Nine cultures in Sathikam, 3 in Chittida and 9 in Kesari will be under preliminary yield trials against Co. 13. Seventy-one cultures in Tellasenna vadlu and promising short duration types will be under preliminary yield trials. Three hundred single plants taken in Seevan samba will be under study.

II. *Hybridization.*—(i) Two promising progenies in season and period bound crosses, five progenies in Co. 10, Burma, 36 progenies in Co. 19 × Co. 26, two in Co. 4 × Co. 13 and one of Gumatia × Luchai × Burma will be under yield trials. One hundred and eighteen progenies of Japonica × Indica will be under study while 55 secondary selections from the season and period bound cross progenies and 185 secondary selections in Co. 10 × Burma will be under observation.

(ii) Study of the cross progenies of Sornavari × samba paddies.

(iii) Study of 181 progenies of crosses between cultivated and wild paddies.

(iv) Study of crosses between ADT. 22 and BAM. 3, Co. 4 × Vadan Samba, Co. 10 × T. 892, Co. 17 × SR. 26 B, Co. 17 × 10783 and 183 selections of drought resistant progenies between Coimbatore strains and wild paddies and 52 selections from Cuttack wild natural cross progenies.

III. *Manurial experiments.*—(i) Co-ordinated set of manurial experiments on paddy.

(ii) Dicalcium phosphate experiment.

IV. *Insecticidal trials.*—Trials with DDT and BHC for the control of rice stem borer and rice mealy bug.

V. *Growing Madras Uganda Cotton* as a mixed crop with rainfed paddy; perennial cottons, green manures, fodder crops, fruit plants and vegetables.

(27) *Agricultural College Farm, Bapatla.*

A. General.

A total quantity of 1,19,484 lb. of nucleus paddy seeds was distributed from the farm.

B. Results achieved during 1952-53.

1. *Paddy.*—A study of the performance of promising cultures of paddy received from Agricultural Research Station, Anakapalle, Samalkot, Maruteru and Coimbatore indicated that MTU 20 of the early duration, AKP. 2 of the medium duration, and MTU. 22 of the long duration groups recorded maximum yields of 4,000 lb., 4,000 lb. and 3,532 lb. per acre respectively.

MTU. 22 which recorded maximum yields over the local standards, in the previous seasons, was given out for district trials in Krishna, and increased yields up to 43 per cent over the local standards were recorded in four out of five centres.

Among the cultures of paddy grown under special conditions saline resistant culture 26 B was found best suited for saline conditions while AKP. 12 did well under low-lying conditions.

2. *Sugarcane*.—Five Co. varieties (Co. 527, 419, 449, 475 and 471) were tried under plant and ratoon crop conditions in newly reclaimed sandy loams. Co. 527 recorded maximum yields of 25.4 tons and 17 tons under plant and ratoon crop conditions respectively.

3. *Banana*.—Among the twenty varieties of banana grown in sandy loams, *Karpuracheckrakeli*, and *Amrutapani* among the fruit varieties and *Kostha bontha* and *Nei-vannan* among the fruit varieties recorded maximum bunch weight nearing 20 lb.

4. *Ragi*.—In an yield trial with three cultures, AKP. 2, AKP. 6 and EC. 4601, and local under rainfed conditions in sandy soils, between July and October and under splash irrigation between December and March AKP. 6 recorded maximum yields in the two seasons confirming similar conclusions drawn in the previous year. The culture AKP. 6 has since been given out for district trials.

5. *Pulses*.—(a) Among the eight cultures of redgram under study, culture No. 72 recorded maximum yields of 235 lb. per acre.

(b) In the horsegram yield trial with five cultures and local, DB. 116 and 76 recorded maximum yields.

6. *Linseed*.—Of the six cultures under trial K2 was the best recording 622 lb. of seed per acre. It was observed that linseed does not thrive well under local sandy soil conditions without splash irrigation and raising the crop under splash irrigation is not economical.

7. (a) *Cotton*.—Among the six cultures grown under rainfed conditions 336 B gave maximum yields of 419 lb. of kapas per acre. P. 216 F grown in rice fallows under garden land conditions recorded 545 lb. of kapas per acre. Manuring with 40 lb. N in the form of ammonium sulphate resulted in 22 per cent increased yields over unmanured plots.

(b) *Gogu*.—Of the four indigenous types grown under rainfed conditions in sandy loam soils *kasi gogu* followed by *kaki gogu* gave maximum yield of 1,140 lb. and 850 lb. of fibre respectively.

8 *Perennial grasses*.—Among the four varieties of perennial grasses under study Napier X cumbu followed by buffalo grass recorded maximum acre yields of 31,320 lb. and 28,530 lb. of green fodder.

9. *Green manure crops*.—Among the several varieties of green manure grown in paddy fallows for study, *Sesbania speciosa* was found to be the best yielder of green matter with an acre yield of 35,333 lb. sunhemp and wild indigo grown in paddy fallows for fodder and green manure, recorded an acre yield of 1,000 lb. of sunhemp hay and 3,500 lb. of green matter as wild indigo.

10. *Vegetables*.—Wynaad variety of cucumber was found superior to the local with 50 per cent increased yield. Wynad cucumber though is bigger in size than the local, and stands storage for long periods as the local variety, it is insipid in taste.

Dolichos lablab culture No. 692 was the best among the seven cultures and the local variety tested, recording 9,550 lb. of vegetable per acre. *Lablab* culture No. 692 was also found to be less susceptible to pod borer and aphid attack.

11. *HS. 9 Tobacco Scheme*.—Three acres of tobacco nurseries were sown with selfed HS. 9 seed for supply of seedling to the tobacco grower of the locality. Eleven lakhs five thousand two hundred seedlings were supplied to the seed farm and other growers. A profit of Rs. 1,545 per acre was realized.

12. *Alkathine film lined gunny trial*.—A trial was conducted on storage of superphosphate in Alkathine gunnies as against the normal storage with single and double gunnies.

The Alkathine film was found to withstand the acid action of superphosphate even up to a period of one year while single and double gunnies got deteriorated in three to four months. There was a reduction in the weight of the contents during the first fortnight due to the loss of moisture in all the treatments. The variations recorded on subsequent dates were too small to indicate any significance. The results are in conformity with the last year's findings.

C. Programme of work for 1953-54.

1. *Paddy*.—(a) Study of paddy cultures suitable for the locality.
(b) Trial of paddy cultures under special conditions.
(c) Study of the effect of application of different levels of nitrogen and phosphoric acid to paddy.
(d) Study of the placement of ammonium sulphate to paddy.
(e) Study of the effect of continuous application of organic manures to paddy.
2. *Sugarcane*.—Study of the performance of promising Co. cultures in the locality.
3. *Banana*.—Study of the varieties suitable for the tract.
4. *Ragi*.—(a) Yield trial of promising cultures, with local variety under rainfed conditions and splash irrigated conditions.
(b) Study of the response of ragi to the application of chilean nitrate versus ammonium sulphate.
5. *Pulses*.—Comparative study of different cultures against the local varieties in redgram, horsegram, bengalgram and cowpea.
6. *Oil seeds*.—Comparative study of different cultures against the local varieties in groundnut, gingelly and castor.
7. *Fibres*.—(a) Study of the performance of different rainfed cotton cultures suitable for the locality.
(b) Study of the performance of *pusa gogu* and *local gogu* varieties.
8. *Green manures*.—Trial of different kinds of mixtures to solve the green manure problem in single crop wet land areas.
9. *Vegetables*.—Study of the performance of different cultures and varieties of *Dolichos lablab*, cowpea, cucumber and brinjal.
10. *Fodders*.—Study of different varieties of perennial grasses suitable for the tract.

(28) *Sugarcane Research Station, Anakapalle (Visakhapatnam district).*

A. Results achieved during 1952-53.

1. *Sugarcane*.—The three standard varieties Co. 527, Co. 449 and Co. 419 continue to be the best for early, mid and late seasons. Preliminary investigations indicated the possibility of increasing the yield of poor yielding, early varieties, by early planting and adequate manuring.

without loss in quality. That farm yard manure alone cannot be an efficient source of nitrogen for cane in respect of yield was confirmed. Planting cane in deep trenches and banking high followed by trash twist propping was found to reduce cost of cultivation by a considerable extent in respect of even a fifty-four tons crops on the station. Lodging up to 30 degrees from the vertical did not seriously affect the quality. Lodging beyond this angle led to about 25 per cent loss in sugar. That this depression is not due to disturbance to the root system but due to physiological phenomena inside the plant was also established. By a detailed study of nitrogen nutrition of cane, the first dose of concentrates was shifted to forty-five days after planting. Application of manure after August was not found to be efficiently utilized apart from the fact that such late manuring depresses quality. Studies in foliar diagnosis indicated the sufficiency level of the leaf nitrogen to be about 2.0 per cent, a figure which is close to the figure reported from other countries. Clarification of juice by liming was studied in relation to the PH. level of the juice. In respect of mature cane juice PH. 6.0 and in respect of immature cane juice PH. 6.4 after liming gave satisfactory results. The deteriorated juice continued to be a problem. The quicker decomposition of cane trash was when pig manure was used as starter it was found to be due to factors other than the level of nitrogen, phosphoric acid and potash in the pig dung. The comparative merits of organic and inorganic forms of nitrogen under different levels of soil moisture indicated the superiority of inorganic form under higher soil moisture and that of organic form under low soil moisture conditions.

That the loss due to smut is predominant in respect of yield (up to 55.65 per cent) and almost nil in respect of juice quality were confirmed. Similar were the results in respect of the early shoot borer which could be controlled by the spraying of 0.32 per cent DDT. Planting cane by January recorded highest yield and quality followed by plantings in May. Planting cane in September particularly with Co. 449 was helpful in increasing quality in early crush. March of ripening was the quickest by (?) plans in May while it was most economical to plant in January. The lower yields by the late planting were mainly due to lodging and breakage.

2. *Paddy*.—There were two series of yield trials. Gummasari 3948 was the best yielder for the third year in succession and it has been selected for district trials.

In a trial to study the suitability of some of the promising strains for late planting it was found that Co. 25 recorded the highest yield.

3. *Millets—Ragi*.—Ganti AKP. 2 yielded 1,058 lb. of grain per acre and jonna AKP. 1 recorded an acre yield of 335 lb. per acre.

4. *Green manures*.—A total area of 26.70 acres was sown to green manure crops of which sunhemp occupied an area of 20.39 acres. It recorded an acre yield of 10,044 lb. of green matter as against 10,036 lb. during the previous season. Cowpea grown in an area of 4.56 acres recorded an acre yield of 9,441 lb. *Sesbania speciosa* was grown in an area of 1.75 acres.

This crop sown in 55 cents early in the season gave the maximum yield of 20,000 lb. of green matter in 90 days.

From the plants grown on the field bunds 1,636 lb. of *Sesbania* and 57 lb. of *Gliricidia* seeds were collected.

5. *Vegetables*.—A quantity of 74 lb. of brinjal (purple round type) seed was collected.

6. *Cropping in rice fallows*.—Tenkasi redgram, cotton P. 216 F, TMV. 3 groundnut, TMV. 2 and TMV. 3 gingelly have been cultivated in rice fallows. TMV. 1 and TMV. 3 gingelly strains recorded the acre yields of 349 and 418 lb. of grain, respectively.

B. Programme of work for 1953-54.

1. *Sugarcane*.—Studies in sugar content of cane juice with reference to varieties and agronomical conditions.

2. *Paddy*.—Late planting trial. Japanese method of cultivation of paddy and co-ordinated manurial trials of paddy.

3. *Millets*.—Study of tillering habit in ragi, placement method of manuring versus top dressing in ragi, study of the optimum dosage of green leaf as soil amendment with reference to rainfed ragi and cholam.

4. *Fruits*.—Trials to combine individual desirable characters and to develop interesting, novel and commercially economic forms in sapota, to find the best season for the propagation of guava and to find out the optimum season for grafting in jack.

5. *Vegetables*.—To purify the local promising types and to study hybrid vigour in brinjal.

(29) *Sugarcane Research Station, Gudiyattam (North Arcot district)*.

A. General.

During the year, 45,484 lb. of sugarcane seed material, 7,671 lb. of paddy seeds and 700 lb. of gingelly seed were made available for distribution.

B. Results achieved during 1952-53.

(a) *Sugarcane*.—(1) *Varietal study*.—Based on juice qualities and other agronomical character, the following varieties were found promising compared to the standards:—

Early group—Co. 727, Co. 792, Co. 851, Co. 889, I.C. 233.

Mid season group—Co. 738, Co. 808, Co. 888.

Late varieties—Co. 710, Co. 715, Co. 724, Co. 737, Co. 747, Co. 750, Co. 758, Co. 761, Co. 776, Co. 782, Co. 785, Co. 905, I.C. 225, I.C. 235.

(2) *Time of planting and harvesting*.—Both for cane yield and for sugar recovery, planting in January and harvesting at 12 months age was the best followed by May and September plantings. Under all months of planting season had more pronounced influence on maturity than the age of crop.

(3) *Pit planting observation plot*.—The cane yield from the normal planting was superior to that from pits. The cane population in pits were very low which resulted in low yield. The cost of production per ton of cane was higher in pits than the control.

(b) *Paddy*.—An average acre yield of 2,400 lb. from GEB. 24, 3,466 lb. from MTU. 19 and 2,225 lb. from ASD. 5 were obtained as against 2,592 lb. from GEB. 24 and 1,580 lb. from ASD. 5 obtained last year. In the previous year MTU. 19 was under observation and it yielded 3,420 lb. as against 3,000 lb. from GEB. 24. So also this year, it has yielded better than GEB. 24 and ASD. 5.

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During Navarai and Kar seasons TKM. 3 and Co. 13 over 0.65 acre and 2.20 acres were raised respectively and the average yields recorded in them were 2,373 lb. from TKM. 3 and 2,088 lb. from Co. 13.

(c) *Cotton*.—P. 216 F was raised over 1.30 acres and it recorded an average yield of 370 lb. of kapas per acre.

(d) *Gingelly*.—Gingelly TMV. 3 recorded an average yield of 261 lb. per acre.

(e) *Groundnut*.—TMV. 3 yielded an average of 276 lb. per acre.

C. Programme of work for 1953-54.

I. *Sugarcane*.—(a) Seventy-eight varieties are being studied for selecting promising varieties of cane.

(b) The study of promising early varieties is being continued in the main yield trial.

(c) Preliminary yield trial with early varieties is being conducted from 1952-53.

(d) Time of planting and harvesting trial is being continued for the third year.

(e) Rayungans are compared with top setts to judge the suitability of the former as seed material for the tract.

(f) Planting of sugarcane in pits as practised at Sholavandan is being tried in observation plots.

(g) The utility of chilian nitrate as nitrogenous manure for sugarcane is being studied in observation plots.

II. *Paddy*.—A comparative trial with GEB. 24 Cultures 1,246 and 388 received from the Superintendent, Agricultural Research Station, Maruteru, on the instructions of the Paddy Specialist will be laid out. TU. 19 will be again compared with GEB. 24 in large areas.

General.—Large scale collection of *Sesbania speciosa* and *Glyricidia* seeds will be taken up. Vegetable seeds will be collected on a large scale for distribution. Greater number of layerings, grafts and budded plants of fruit trees will be produced and distributed.

(30) Agricultural Research Station, Satyamangalam.

A. General.

During the year the work on the farm was limited to raising bulk crops on the dry lands and also on about six acres of the existing garden land, besides starting a few experiments with the limited facilities available.

B. Results achieved during 1952-53.

Four experiments were conducted, on a small block of dry land that could be irrigated from the existing well stimulating project condition of irrigation once in about 10 days and 2 inches in depth. Of the varying doses of organic matter applied to cotton MU. 1. 7,500 lb. gave increased yields over the lower doses and control.

On a short duration crop like ragi applications of organic matter, in different forms like compost, cattle-manure and green leaf were made. The increases noted in a few treatments were not marked to the significant level. Of the legumes tried for their suitability to the tract daincha is found to be promising for quicker growth and capable of giving good tonnage under irrigation. In the summer cholam varietal trials, strain Co. 16 received from the Millets Specialist was found to be suited for good yields of grain as well as straw.

Physico-chemical investigations on the pre-irrigation soils collected from the station fields have given the following useful results:—

Salt content of both the surface and deeper layers of the soil as well as the exchangeable sodium contents are very low, while the calcium status is high. This feature coupled with the porous texture of the soil precludes any possibility of the development of alkalinity in these soils due to irrigation.

The soils are poor in nitrogen and phosphoric acid contents and hence a good response to applications of these fertilizers are expected.

To prevent high seepage losses and increase the water-holding capacity of these open and coarse soils with low clay and humus contents, it is necessary to improve the physical texture by applications of green manure or bulky organic matter.

G. Programme of work for 1953-54.

A. *Agronomical Long-range experiments Nos. I to III*.—I. *Rotation experiment*.—Two-year rotation. Study of the different systems of rotation to evolve the most suitable one for the tract.

II. Experiment with duty of water on cotton raised in rotation with ragi, cumbu, cholam and groundnut with variants 2 inches depth of irrigation once in ten days and one inch in five days.

III. *Manurial experiments—Methods of soil amendment*.—(a) Study of the variety of legume suitable for the tract, by growing legumes from March to September like daincha, sunnhemp, cowpea, dewgram and indigo with and without phosphate and ploughing them *in situ* to study their effects on cotton and cereals raised under regular rotation.

(b) Dose of organic matter requirements of application of legumes like daincha, sunnhemp, cowpea and *Glyricidia* and *Sesbania* grown elsewhere and applied in doses 2,500, 5,000 and 7,500 lb. to cotton and to the cereals with basal doses of N 45 lb. and P₂ O₅, 30 lb. applied in instalments.

(c) Comparative value of green manure, cattle manure and compost (farm waste) applied in doses equivalent to organic matter contents of 2,500, 5,000 and 7,500 lb. of sunnhemp in addition to fertilizers like Ammonium sulphate and super to cotton and cereal crops raised under rotation.

IV. *Varietal trials*.—With varieties of—(a) cotton, cholam, cumbu, ragi, groundnut, gingelly and redgram supplied by the Specialists during the project season in the observation plots to start with.

(b) Small-scale trials with Masipattam cotton and summer cholam.

Miscellaneous.—Growing grape vine and plantain varieties and tobacco varieties on a small scale.

Chemical side.—(1) Working out suitable manurial schedule for the ayacut area.

(2) Study of the changes in soil characteristics due to the successive applications of organic carbon content, development of structure, base exchange properties and water-holding capacity.

(3) Analysis of samples of soils, manures and plant materials, etc., connected with the investigations conducted at the farm as well as the pot culture studies.

(4) Pot culture studies as a complement to the field trials with a view to the improvement of the fertility status of the soils.

(31) *Panagal Farm, Kalahasti (Chittoor district).*

1. This is a demonstration farm. All the major crops of the district were cultivated here as per improved methods advocated by the department.

2. During the year under report the total receipts of the farm was Rs. 9,732 against an expenditure of Rs. 5,559 thus resulting in a net profit of Rs. 4,173.

(32) *Rice Research Station, Ambasamudram (Tirunelveli district).*

A. General.

A total quantity of 65,629 lb. of paddy seeds and 746 lb. of green manure seeds were distributed from the station.

B. Results achieved during 1952-53.

Paddy—(1) *Study of the cross progenies of ASD. 1 and Veedividangan.*—The yield trial with the 14 selections and two parents was repeated. Yield data as well as data regarding their shedding nature were collected and the yield trial is proposed to be conducted for one more season.

(2) *Study of the cross progenies of ASD. 1 and other local short-duration varieties.*—Six selections were compared with ASD. 1 and ASD. 7 and two of them have been fixed for further trials in the next season.

(3) *Trial with the inter-strain cross progenies.*—The two hybrids, 3798 and 3800, were compared with ASD. 1 in unreplicated observation plots and there was no appreciable difference among them.

(4) *Seenganni, Maikuruvai and Banku.*—Pure-line selection work was continued in these varieties and 48 selections in *Seenganni*, 31 in *Maikuruvai* and 118 in *Banku* were carried over for further work.

(5) *Kolavalai.*—Selection 7195 was released as ASD. 10.

(6) *Arikiravi.*—Ten selections were compared against the unselected bulk and based upon their performance, six selections were fixed for further work.

(7) *Puluthipiratti.*—Seventy-three selections were under study and 35 were fixed for further work.

(8) *Sembuli and Varigarudansamba.*—Three hundred and ninety-eight selections in *Sembuli* and 340 in *Varigarudansamba* were under study out of which 160 and 150 respectively were fixed for further work.

Miscellaneous.—Trial of groundnut in the rice fallows during the summer months of March, April and May. The second year's trial confirmed in a way the indications of the previous year, namely, raising a crop of groundnut after the *Pishanam* paddy is possible.

C. Programme of work for 1953-54.

I. *Improvement of local varieties by pure-line selection—Kar or first crop*—(1) *Mai Kuruvai of Tirunelveli district.*—Isolation of a high-yielding strain in this variety of red-riced short-duration paddy.

(2) *Seenganni of Tirunelveli.*—Same as above.

(3) *Banku of Ramanathapuram.*—Isolation of a culture in the short-duration white-riced paddy reputed to be drought resistant.

Pishanam or second crop—(1) *Varigarudan Samba of Ramanathapuram.*—Isolation of white-riced variety.

(2) *Arikiravi of Tirunelveli.*—Isolation of a high-yielding strain in this red-riced coarse variety of medium duration.

(3) *Puluthipiratti of Tirunelveli district.*—Isolation of a high-yielding strain in this medium-sized long-duration variety slightly drought resistant.

(4) *Sembuli of Tirunelveli district.*—Isolation of a high-yielding strain in this medium-sized long-duration paddy.

II. *Improvement by hybridization—Kar or first crop—ASD. 1. × ASD. 3.*—To induce non-shedding character in ASD. 1.

Pishanam or second crop—(1) *Kavinginpothala GEB. 24, natural cross progenies.*—To pitch upon a selection which will be better than the second crop varieties, ASD. 5 and ASD. 6.

(2) *Progenies of Co. 14 × Co. 8.* Isolation of a hybrid selection which will be better than ASD. 6.

III. *Cultural and manurial experiments—Kar or first crop*—(1) *Summer ploughing experiments.*—To test the soundness of the local practice of giving repeated dry ploughings to the paddy fields after harvest of the second crop during summer months as preparation to kar crop.

Pishanam—(1) *Stem borer control experiment.*—To test the efficacy of different insecticides in controlling the stem-borer of paddy. Trial of DDT and BHC in different concentrations.

(2) *Japanese method versus Farm method experiments.*—To find out the superiority of Japanese method with two local strains.

IV. *Miscellaneous*—(1) *Maintenance of type collection.*—To serve as a testing ground for any new strain or variety and also to serve as parents for future crossings.

(2) *Trial of groundnut as a rainfed crop during the fallow period*—March, April and May.

IX. CROP-CUTTING EXPERIMENTS

A review on the Crop-cutting experiments by the random sampling method conducted in Madras State during the 1362 fasli (1952-53).—This work was in progress under the control of the Economic Adviser to the Government with a special staff of one Deputy Director, one Statistical Officer and eight District Agricultural Officers.

The period under review was the third year of the implementation of the five-year co-ordinated scheme of crop sampling surveys in this State. Crop-cutting experiments for estimating the average yield per acre and the total outturn were continued on four major food crops, viz., (1) paddy, (2) cholam, (3) cumbu and (4) ragi during the year 1952-53. The survey for estimating the additional production of rice due to the application of the three principal grow more food aids, viz., improved paddy seeds, green manure seeds and ammonium sulphate was also continued during the 1362 fasli. The pilot surveys on castor and gingelly and the Statewide survey on groundnut conducted in the previous fasli were not continued during the period under review due to want of sanction.

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The results of the experiments conducted during 1952-53 are summarised below :—

CATEGORY I—MAJOR FOOD CROPS.

Paddy.—The experiments on paddy crop were conducted, as in the previous year, during the three periods covering the crop harvested, from July to October, November to March, and April to June respectively. The number of experiments planned for the first period was 300 distributed in 150 villages at the rate of two experiments per village. Of these, 287 experiments were completed satisfactorily. For the second period crop, 2,066 experiments were planned out of which 1,949 were completed. As against 208 experiments planned for the third period, 144 experiments were conducted. Thus, in all the three periods taken together, 2,380 were completed as against 2,574 planned. This works out to 93 per cent of the total number of experiments planned for the year. The corresponding figures during the previous year were 2,361 and 2,540 and 93 respectively. The progress has thus been maintained.

The results of the statistical analysis for the first second and third period crops are given in Tables I, II and III, Appendix No. 7 (a) and (b). The average yield of rice for the State as a whole of the first period crop is 1,002.1 lb. per acre with a standard error of 3.5 per cent. For the second period the average yield is 1,021.9 lb. per acre with a standard error of 2.7 per cent. The yields during both the periods are higher than the corresponding yields during the previous year which were 989.9 and 1,015.0 lb. per acre respectively.

CATEGORY II—MAJOR FOOD CROPS.

Millets.—As against 6,788 experiments planned for millets, only 2,918 experiments were completed satisfactorily, i.e., about 43 per cent. The corresponding figures for the previous year were 4,536, 1,946 and 43 per cent respectively. The number of experiments planned and the number completed under each of the millets are given below :—

Category of experiments.	Number of experiments.		Percentage of the number completed to the number planned.
	Planned.	Completed.	
(1)	(2)	(3)	(4)
Cholam—Irrigated	904	374	41
„ Rainfed	1,614	696	43
Cumbu—Irrigated	608	260	43
„ Rainfed	1,424	596	42
Ragi—Irrigated	1,534	686	45
„ Rainfed	704	306	44
Total ..	6,788	2,918	43

The loss of such a large number of experiments was chiefly due to lack of adequate interest on the part of the Revenue subordinates in the conduct of these experiments for various reasons.

The statistical analysis has been completed in respect of irrigated ragi crop, irrigated cumbu, unirrigated cumbu and unirrigated ragi. As for unirrigated cholam, the analysis is in progress, and combined results of irrigated and unirrigated crops for all the categories are not yet available.

Irrigated ragi—First-crop.—From Table III, it can be seen that the average yield per acre is 930.32 lb. and the percentage standard error is 4.55. The production estimate for the State worked out to 144,300 tons.

Irrigated cumbu.—It will be seen from the Table IV that the average yield per acre is estimated at 915.6 lb. and the percentage standard error 4.6. The production estimate for this crop for the State as a whole worked out to 115,000 tons.

Unirrigated cumbu.—From Table V it will be seen that the average yield per acre is estimated at 308.13 lb. and the percentage standard error at 6.15. The estimated production of this crop for the State as a whole is of the order of 276,700 tons.

CATEGORY III.—STATISTICAL ASSESSMENT OF ADDITIONAL PRODUCTION DUE TO GROW MORE FOOD AIDS.

Crop-cutting experiments were conducted with improved paddy seed, green manure seed and ammonium sulphate in all the three seasons of the paddy crop. Unlike in the previous years, no distinction between pre-manuring and post-manuring stages of experiments was made in respect of experiments with ammonium sulphate. It was designed to plan the experiments at only one stage, viz., pre-manuring stage as no practical advantage was gained by having two separate categories under the aid. The total number of experiments planned for the State as a whole during 1952-53, was 504 as against 1,484 in the previous year. The steep decline in the number of experiments planned for the year was partly due to the dropping of experiments at the post-manuring stage and to the change in the basis of the selection of beneficiaries direct from the list of beneficiaries for the taluk as a whole instead of from the villages where Grow More Food aids have been distributed, as hitherto. The statistical analysis of the results relating to the experiments in the list and second period is summarized in Table VI appended.

It will be seen from the table that the rates of response due to the application of improved paddy seeds, green manure seeds and ammonium sulphate were respectively 144 lb., 207 lb. and 288 lb. per acre during the first season and 171 lb., 257 lb. and 291 lb. per acre during the second season.

As the results relating to the third period are still under analysis, the combined additional yields for the entire year are not available at present.

X. TUNGABHADRA PROJECT.

Agricultural Research Station, Siruguppa.—The station was started with the object of studying the effect of irrigation water on movement of salts in the soils of the Tungabhadra Project area and for determining suitable crops, rotations, cultivation methods, etc., suitable for the ayacut.

Chemical investigation on the effect of light and heavy irrigation on the black soils was continued. It was found that salts do not rise to the surface. This finding is in conformity with that of previous years. It is

indicated that alkalinity will not develop as a result of irrigation of black soils of the Project area. Analysis of drainage-water from paddy lands during crop growth clearly shows the presence of salts merely showing that injurious salts are moving down in drainage-water. As in previous years this year also paddy varieties AKP. 2 and GEB 24 have recorded maximum yields of 4,006 lb. and 4,592 lb. respectively and these two strains are recommended for June-December season. AKP. 2 is earlier by two weeks and is recommended in lands where sugarcane is grown in rotation as it gives time for preparation of land for cane.

For late planting in the September-February season paddy strains Co. 2, ASD. 5, ADT. 18 and MTU. 15 were found to give good performance and are recommended. Experiments have indicated that plantings of paddy in second fortnight of September, have given higher yields over the first fortnight of October. It is advisable not to delay planting of paddy beyond first week of October in the Project area.

For summer February-May season, paddy varieties Co. 13, ADT. 18 and MTU. 15 had given yields of 2,996, 3,013 and 3,366 lb. per acre respectively.

In groundnut AH. 4,111 bunch and TMV. 4 spreading have recorded highest yields of 1,450 and 8,766 lb. per acre respectively. Out of three gingelly strains tried TMV. 2 has given highest yield of 320 lb. per acre. Castor variety TMV. 2 gave the maximum yield of 500 lb. per acre.

Five varieties of sugarcane were allowed to ratoon and for the first ratoon Co. 449 gave the maximum yield of 28.4 tons per acre.

Phosphate experiments clearly indicate the paddy responds to 40 lb. N. plus 80 lb. P_2O_5 , korra responds to doses of 40 N. and 60 lb. N.

Lakshmi Cotton Combodia has given the highest yield of 1,450 lb. per acre.

Results of early and late cropping under irrigation.—The results of early and late cropping are furnished in the statement below :—

Serial number and name of the crop.	Area in acres.	Acre yield in lb.		Maximum yield recorded per acre.	
		Grain.	Straw.	Grain.	Straw.
(1)	(2)	(3)	(4)	(5)	(6)
1 Paddy AKP. 2	1.05	3,587	5,026	4,006	4,480
2 Paddy GEB. 24	4.11	3,243	4,628	4,592	8,000
3 Jonna Co. 9	8.96	1,884	3,035	3,141	4,741
4 Jonna 8378 (Tenkasi type) ..	1.85	1,697	8,087	2,470	9,263
5 Korra N. 1	0.78	1,453	2,063	1,453	2,063
6 Maize	0.52	3,154	4,586	3,425	4,483
7 Bingari jonna M. 31-2 ..	3.87	1,004	5,466	1,340	7,722
8 Glunned wheat	4.42	1,038	..	1,404	..
9 Naked wheat G. 253 ..	0.40	355	..	355	..
10 Bengalgram	6.46	190	..	239	..
11 Sugarcane Co. 419	0.54	24	..	24	..
12 Groundnut plus redgram mixture.	5.83	848 pods 96	1,238 haulms.	969 276	1,880 haulms.
13 Cambodia Cotton—					
(i) Lakshmi	3.79	817	..	1,450	..
(ii) M.A. 2	0.42	988	..	988	..
(iii) H.A. II	5.52	960	..	1,340	..
14 Bellary onion	0.32	16,259	..	..	16,259

Bagavadi Demonstration Farm.—The ryots of the Bagavadi Demonstration farm adopted the improved methods of raising crops under irrigation with the departmental strains on the lines recommended by the Agricultural Research Station, Siruguppa. The layout of the fields into beds with the bund former for easy and economic irrigation, the method of applying chemical manures earthing up of cotton with the ridge plough and preservation of cattle manure were demonstrated to the ryots. One observation plot of MA. 2 and Lakshmi cotton was run. The yields of important crops raised are given below :—

	Per acre.
	LB.
Paddy GEB. 24	2,889
Jonna Co. 9	625
Korra No. 1	690
Cambodia Laxmi (Kapas)	912
Wheat glumed	750

XI. COMMUNITY PROJECTS.

Under the Indo-United States Technical Co-operative Agreement, the Planning Commission has proposed the establishment of 59 community projects centres in the country. Out of these this State has been allotted six. Each project has been assumed to comprise about 300 villages with an approximate total area of 150,000 acres and a population of 200,000. The project area is to be divided into three development blocks each consisting of about 100 villages with a population of 60,000 to 70,000. The development block in turn is divided into groups of 50 villages each. Each such group will be the field of operation of a village level worker. The main object of the community project is to secure the fullest development of material and human resources of the area.

The following are the selected centres for this State where work of Agricultural and Rural Development is in progress :—

1. Kurnool-Cuddapah area (Andhra).
2. East Godavari district (Ramachandrapur taluk and parts of Kakinada, Peddapuram, Pithapuram taluks (Andhra).
3. Lower Bhavani Project area (Coimbatore) (Tamil).
4. Malampuzha Project area and Palghat taluk in Malabar district (Malayalam).
5. Periyar-fed. area in Madurai district (Tamil).
6. Mangalore and Kasargod taluks of South Kanara district (Kannada).

Programme of Agricultural Development work was drawn up for each of these centres and communicated to the project executive officers. Three training centres were opened at Kakinada, Palghat and Dindigul for training of village level workers.

XII. COLONIZATION SCHEMES.

The work in the two Colonization Schemes continued during the year.

1. ABAKU VALLEY SCHEME, VISAKHAPATNAM.

The main items of work of the farm consisted of improvement of local crops and introduction of new crops.

Paddy.—Four strains of paddy MTU. 3, AKP. 1, SR. 26 B, AKP. 2, BAM. 3 and Ninnidhan (Mass selected) were grown over 7.5 acres. Paddy blast attack on transplanted crop of MTU. 3 and AKP. 1, was severe. BAM. 1 affected in the nursery by blast could not be planted. MTU. 3 has given the highest yield of 2,416 lb. per acre followed by SR. 26 B. with 2,345 lb. AKP. 1 with 2,233 lb. AKP. 2 with 2,134 and Ninnidhan (Local) with 1,966 lb. per acre. Among five varieties of second crop paddy grown MTU. 15 has given the highest yield of 2,380 lb. per acre followed by MTU. 9 with 2,000 lb. per acre. Mass selection work is in progress in the early maturing type Sattikalalu.

Ragi.—The ragi crop has come up satisfactorily during the year with the highest yield of 1,249 lb. Observation plots of 6 varieties of ragi were grown.

Samai.—Mass selection in Pedda Sama (Local) was taken up and seed was distributed to ryots.

Potato.—Six cents under imported "Great Scot" gave an acre yield of 8,500 lb. This variety is being tried on a large area in the monsoon season along with the variety "Mysore Rickets."

Sweet potato.—Trials with six varieties of Almora, Sweet Potato varieties were continued. Varieties "Triumph" Ranger and B. 5,941 gave the highest yields. The first two have been distributed to the hillmen.

Sugarcane.—B. 208. The performance of this chewing type during the year was not satisfactory.

Groundnut.—TMV. 3 strain was tried on the farm and seed distributed to hillmen.

Kasigogu.—Seventeen cents were grown and a fibre yield of 1,276 lb. per acre was obtained. Seed is distributed to the ryots as a profitable crop.

Vegetables.—Exotic and indigenous vegetables were grown successfully and produce sold to the residents of the colony. Cucumber Arlington was successful and seed has been distributed to hillmen.

Orchard.—Large scale propagation work is carried on oranges, grape fruits, lemon, lime, guava, grapes, etc., to increase the area under fruit trees in the colony.

Dairy unit, etc.—The dairy unit of 17 she-buffaloes was maintained. Poultry unit of White Leghorn birds was continued. Mandya sheep seem to be thriving on the colony and rams are distributed to hillmen to grade up local stock. Mirror carp fish was reared in the pond in the orchard.

Extension work.—Demonstrations and propaganda on improved methods of cultivation were continued. The following are the salient features:—

Waste land reclaimed—102.24 acres.

Areas ploughed by tractors—409.74 acres.

Seeds distributed—

Paddy—3 tons 202 lb., area covered 231 acres.

Green manure seeds—170 lb., area covered 4.25 acres.

Green leaf applied—Area covered 305 acres.

Ragi—2,001 lb., area covered 200 acres.

Fruit plants distributed—5,054 nr—

Increase of area under vegetables

Groundnut—40 lb. $\frac{1}{2}$ acre.

Niger—2,046 lb. 204 acres.

Tree seedlings planted—1,20,600 numbers.

Municipal compost prepared—670 tons.

Manure pits opened—58 numbers.

Dry earth sheds—1,209 numbers.

Exhibitions conducted—two.

Agricultural Associations started—Two.

2. WYNAAD COLONIZATION SCHEME.

Work in this Colonization Scheme was continued.

Research—Paddy.—Twenty-two strains and varieties were under trial. T. 1040 Maranellu (Ceylon), Chennellu (Ceylon and Ninnidhan) (Araku Valley) gave satisfactory yields. Chennellu of Ceylon recorded a maximum yield of 3226 lb. SR/26/B and Jeerakasala were found promising.

Fruits.—The trial of various fruit trees was continued and their performance recorded. Malta lemon, Seville lemon, passion fruit and papaya were found to be well suited for extensive cultivation in Wynaad. Among plantains Gros Michel, Mauritius, Paddapatcha Arati and Sugandhi are the most suited for popularization.

Propaganda.—Intensive propaganda was continued on improved agricultural practices. Salient features of work done are as follows:—

Tractor ploughing—Area covered—33.5 acres.

Tractor levelling—Area covered—91.2 acres.

Contour bunding—200.0 acres.

Paddy seed distributed—28,761 lb.

Amonium sulphate distributed—5,095 lb.

Japanese method of paddy cultivation—100 acres.

Coffee—New planting—400 acres.

Orange—New planting—500 acres.

Pepper—New planting—100 acres.

Vegetables—800 acres.

Compost manufactured—500 tons.

Crop competition—29 entries.

Exhibitions—Two.

Tree seedlings distributed—12,243 Nos.

Fruit preservation work was initiated during the year to utilize surplus fruits—Demonstrations were conducted.

Filter point tube well.—A filter point tube well sunk in the farm yielded 2,000 gallons of water per hour. It is proposed to install a 6 inches filter point in this area next year to augment water supply in summer.

Livestock.—The Sindhi bull performed 28 services during the year. The 7 cows in milk gave an average yield of 7.6 lb. per day. Two Sindhi bull-calves were sold.

XIII. PROPAGANDA AND PUBLICITY (EXTENSION WORK).

The extension staff in the districts concentrated their attention on the (supplies) schemes under the Intensive Cultivation Schemes, consisting of the scheme for distribution of agricultural aids like fertilizers, manures and improved seeds to ryots with a view to increase the yield of paddy and millets. The campaign of intensive growing of green manure crop "Sesbania speciosa" was continued. Sufficient seed of this newly introduced green manure crop was collected for expansion. Widespread propaganda in

selected villages was done in "Japanese method of cultivation of paddy" and intensive manuring of the paddy crop. The District staff carried on intensive propaganda conducted varietal manurial and cultural trials on improved agricultural methods. Propaganda was also carried on the cultivation of short term food crops like sweet potato and tapioca and vegetables. The Vanamahotsava and compost weeks were celebrated. The prompt control of pests and diseases of food crops was attended to and the widespread use of pesticides is becoming popular. The district staff also attended to crop cutting experiments and to the harvest of crop competition plots. Seed multiplication work was one of the important items of work attended to by the District staff. Cotton Extension work and sugarcane development work launched last year were continued. The special staff for (i) intensive rural welfare work in selected firkas, (ii) intensive manuring work in selected districts, (iii) development of sugarcane in selected areas, (iv) demonstration of control measures against pests and diseases, and (v) cotton extension, was continued during the year. The staff of 100 additional Agricultural Demonstrators is being continued but they have been given separate headquarters in the taluks and separate jurisdiction for work. The District Officers were on tour constantly and maintained their contact with the farming public. Sulphate of ammonia and other fertilizers were being stocked on large scale by the Department for distribution to the ryots.

The miscellaneous schemes under the Intensive Cultivation Scheme, viz., registered model farms, honorary propagandists, distribution of seed on exchange basis, distribution of seed by seedfarm ryots were all discontinued during the year.

Publicity.—The Grow More Food Journals published monthly in the four regional languages, i.e., Tamil, Telugu, Malayalam and Kannada continued to be popular. The strength of subscribers at the close of the year was as follows:—

Padipentalu (Telugu)—30,530.

Mezhichelvam (Tamil)—24,154.

Naveenakarshaka (Malayalam)—3,669.

Krishikerabandhu (Kannada)—2,191.

The rate of annual subscription continued to be Rs. 2-4-0 with the object of making the publication of these journals self-supporting. However there was a marked fall in the total number of subscribers. The following leaflets and popular pamphlets were printed during the year. Seven thousand seven hundred and sixty-four copies of villagers' calendars in the four regional languages were distributed. Three lakhs forty-one thousand six hundred and twenty-three copies of leaflets, pamphlets and other publications on different subjects were distributed during the year.

Radio talk.—Thirty-six Radio talks in Tamil, Telugu and English on various Agricultural subjects were given in the Rural Broadcasting Service for the benefit of farmers and rural people.

Crop yield competition.—Crop yield competitions have a great potential value in increasing the yields per acre of the crops and thereby assisting in solving the country's food problem and increasing the agricultural output. The success of the competitions depends largely upon the interest of all local officers and co-operation of the public. If all the ryots take to such competitions and the number of competitors in each village enter the competition a fair percentage of the crop area will come under the competition and will consequently receive special attention ultimately

giving a considerable increase in the production of foodgrains. The competition is also an excellent stimulant to the farmers to use improved methods of agriculture and to learn from the successful competitors as to how the yield can be increased. There was a substantial response to the crop competition conducted during the year on paddy and sugarcane crops.

Crop competition fortnight.—The crop yield competition fortnight was celebrated in all the districts from 1st June to 14th June 1953. Prizes to winners of crop yield competitions were distributed by High officials and personages. Meetings were conducted and object of the competitions were explained and entrants enrolled. Intensive propaganda was done with regard to the extension of crops competition in respect of jowar, bajra. Potatoes in the districts of Kurnool, Bellary, Coimbatore, Guntur and Nilgiris. Two thousand nine hundred and sixteen ryots entered for the 1953-54 competitions in paddy.

Vanamahotsava.—The Vanamahotsava week was celebrated in all districts in the first week of July 1953 with the close co-operation of Revenue, Highways and Health Departmental authorities and meetings were conducted in special centres. Nurseries were raised and economic trees were also distributed. Seeds and seedlings distributed are shown below:—

Fruit tree seedlings—Nos. 638,608.

Other economic trees—4,147,159.

Seeds—5,593 lb.

Cuttings—80,535.

Literature on growing trees for green manure and fodder and for other uses was distributed.

Crops—Paddy.—Multiplication and distribution of improved strains of paddy formed the main item of work. The increase in yield on account of the use of such seeds is estimated to be 10 per cent to 15 per cent over the normal yield. With a view to induce the seed farm ryots to part with their entire surplus seeds, the Government have sanctioned a 10 per cent premium over the local market rate (not exceeding 10 per cent of the last village site price). The seeds so purchased are distributed to farmers charging only half of the premium paid in the sale price. The other half of the premium paid is subsidized by Government. This procedure was in operation during the year since foodgrains were decontrolled in June 1952.

The quantity of paddy seed distributed is indicated below:—

	Quantity.	Area covered.
Paddy	11,139 tons	501,255 acres

Seed-development work.—Improved paddy seeds were multiplied in two stages in primary and secondary seed farms. The seeds so multiplied and the quantity procured are indicated below:—

	Primary seed farms.	Secondary.
	ACS.	ACS.
Paddy	2,627	33,821
	TONS.	LB.
Seed procured	11,897	1,803

Government have sanctioned a sum of Rs. 4,800 for the free distribution of paddy and other seeds to the Yenadis in the reclamation colonies in Chittoor district and a sum of Rs. 4,551 was spent for the purpose during the year.

Millets.—Multiplication and distribution of improved millet seeds formed part of the Intensive Cultivation Schemes. During the year under report seed farms run and seed procured and distributed are indicated below:—

Primary seed farms—4,482 acres (82 cwts.)

Secondary seed farms—7,336 acres (9 cwts.)

Seed procured—451 tons 1,327 lb.

Seed distributed—252 tons, area covered 37,300 acres.

Pulses.—Multiplication and distribution of improved pulses seed also formed another item of the Intensive Cultivation Scheme. The quantity of seed multiplied and distributed is indicated below.

Primary seed farms run—46 acres.

Secondary seed farms run—195 acres.

Seed procured—1 ton 161 lb.

Seed distributed—18 tons 1,675 lb, area covered 5,624 acres.

Cotton.—Cotton is one of the major commercial crops of the state. Cotton seeds of important strains were multiplied and distributed as follows:—

Details of seed production and distribution in the different strains are given below:—

Name of strain.	Quantity of seed distributed for 1952-53.	Target of seeds to be procured during 1952-53.	Actual quantity procured.	Target of seed of farm area.	Actual seed farm area sown.
(1)	(2)	(3)	(4)	(5)	(6)
	Bags.	Bags.		ACS.	ACS.
Co. 2	207	1,500	One hundred and eighty of kapas (ginning in progress).	500	500
K. 5	1,232	10,000	Two thousand and twenty two pothies of kapas ginning in progress.	10,000	10,000
MU. 1 Central districts.	1,175	16,500	Sixteen thousand three hundred and five bags procurement continued.	5,500	5,500
MU. 1 Southern districts.	1,020	12,000	Eight thousand and two hundred bags.	4,000	3,400
K. 2	4,300	20,000	Nine thousand three hundred bags.	30,000	30,000
C. 1	186	691	Procurement in progress ..	600	691
C. 2	5½	109	Do.	200	109
W. 1	728	6,500	Three thousand bags ..	6,503	6,500

The above particulars of seed distribution and multiplication under improved strains of cotton are exclusive of the work turned out under the cotton extension plan which is indicated separately.

The cultivation of cotton in the rice follows of Tanjore district was continued. An area of 495 acres was grown. Propaganda to increase the area is being continued.

Oilseeds.—Arrangements were made for the large scale multiplication of improved strains of groundnut and castor and supplying them to the farmers. Selected coconut seedlings were produced at nine centres and

distributed. Six zonal seed farms were run in different regions. During the year the following quantities of improved strains of seeds were distributed:—

Groundnut pods—19,572 lb.

Groundnut kernel—1,823 lb.

Gingelly—2,490 lb.

Castor—5,071 lb.

Cashewnut seed—566 lb.

Coconut seedlings—132,273 numbers.

Indents for groundnut growers for seed of improved strains continued to be on the increase and it was not possible to meet the demand due to reduced yields on account of failure of rains.

Seeds of groundnut strains were also supplied to other states and to Pakistan, Ceylon, United Kingdom, United States of America, West Africa and France.

Fruits.—Supply of grafts, budded plants, seedlings and cuttings of fruit trees were made to the farmers and fruit growers, from Government Fruit Nurseries. The number of plants and seeds distributed from the different centres is shown below:—

(1)	1952-53.	
	Number of plants supplied.	Quantity of seeds distributed.
(2)	(3)	
Government Fruit Nursery, Kodur ..	19,220	..
Nilgiri Hills fruit stations	3,08,337	250
College Orchard, Coimbatore	9,265	204
Fruit Centres at Araku Anakapalle, Wynaad and Taliparamba	77,073	714
Model Orchard Centres	9,451	1,230
	1,45,846	2,398

Vegetables.—The production of vegetables as a protective food in villages and towns formed one of items of general propaganda. The free distribution of vegetable seeds to schools and co-operative land colonization societies was discontinued from 7th November 1952 as it did not produce good results. In Madras City three special Agricultural Demonstrators attended to propaganda for vegetable growing in compounds of houses and bungalows. The vegetable seed stores was functioning throughout the year. Nine hundred and sixteen pounds of vegetable seeds, 2,920 lb. insecticides, 6,132 lb. fertilisers, 53,775 seedlings, 16,944 tree seedlings, 518 fruit plants and 252 coconut seedlings were sold. Four thousand three hundred and eighty-six kitchen gardens were visited and advice given. The vegetable seed production scheme run at Nothambakkam in Chingleput district did not produce expected results and was closed down. In the districts 5,049 lb. and 1,790 packets of vegetable seeds were distributed.

Sugarcane.—The development of sugarcane cultivation in the districts was attended to by special staff. They were mainly engaged in giving technical advice to cane growers and assisting them to secure improved seed material, selection and planting of disease-free cane, reduction in manuring costs and cost of cultivation, increasing yield, etc., manures implements, etc.

Four Sugarcane Liaison farms functioned during the year where the results of research on sugarcane were practically demonstrated to sugarcane growers such as testing of improved varieties released from the main Research Stations, demonstration of improved methods of cultivation, etc. The work turned out under this is detailed in Appendix IV.

Cattle-manures.—Maintenance of the fertility of the cultivated land being very important, intensive propaganda was done for proper preservation of cattle-manure and augmenting its supplies by composting waste-vegetable matter. The total number of demonstrations conducted is indicated below:—

- Manure pits opened—43,887 numbers.
- Manure pits renovated—36,997 numbers.
- Byre system—6,059 numbers.
- Loose box system—1,283 numbers.
- Dry earth sheds—18,369 numbers.

Loans.—The following are the amounts disbursed under the various loans for the year 1952-53 fasli:—

	RS.
(1) Purchase of seeds and manures	30,33,425
(2) Purchase of Agricultural Implements ..	26,905
(3) Purchase of Chemical manures	77,96,550

There was a keen demand for the loans for the purchase of chemical manures in all the districts where the intensive manuring scheme was in operation. In the districts of Coimbatore, South Arcot and Tiruchirappalli there has been demand for the purchase of Agricultural implements through loans. The loans under 'seeds and manures' were sanctioned free of interest which was availed of by a large number of deserving ryots in the matter of food production. The other kinds of loans were sanctioned bearing interest. Details of loans distributed are shown in Appendix No. 9.

Bee-keeping.—The scheme for the employment of special demonstration maistries for propaganda on bee-keeping continued to be in operation in the districts of Srikakulam, Visakhapatnam, East Godavari, Krishna, Guntur and Chittoor. Thirty-one maistries are working in the scheme and there are 4,764 hives. Due to adverse seasonal conditions the yield of honey was less than normal. The estimated income to farmers from the maintenance of these bee-hives is Rs. 82,200.

Bee-keeping work in and around Madras City was attended to by the Agricultural Demonstrators in the City Vegetable Scheme. In the southern districts the plant protection assistants attended to propaganda and demonstration on bee-keeping and honey extraction. One thousand seven hundred and eighty-one new colonies were hived during the year. The total number of bee-hives maintained by the ryots and other members of the public interested in bee-keeping was 4,783 and 51,205 lb. of honey were extracted from these.

Potato.—On the Nilgiris 56 tons 92 lb. of Great Scot potato seed was distributed to cover an area of 84 acres. 21.25 acres of crop were sprayed with Bordeaux mixture against early blight. Imported "Great Scot" potato planted on 6 cents in the Arakuvalley colonization farm gave an acre yield of 8,500 lb. This variety which appears to be promising is being tried on a large area in the monsoon season along with the variety "Mysore Rickets".

XIV. RURAL WELFARE SCHEME.

The Rural Welfare Scheme continued to be in operation in firkas in the State. This Department has lent the services of 84 fieldmen and 168 demonstration maistries. During the year the scheme was extended to an additional 25 firkas. Due to paucity of staff further assistance by way of staff could not be spared. During the year Government sanctioned the sale of agricultural implements; manures and other essentials to poor and deserving ryots in Rural Welfare areas at concessional rates of 75 per cent of the sale price. The concessional sales were effected through the village co-operative and agricultural depots.

Rural compost.—The preparation of rural compost was in operation as a part of the Grow More Food Campaign, and extensive propaganda and demonstrations were conducted. Till 1952, a sum of Re. 1 per ton of compost produced was being paid as subsidy resulting in an increased production of 2,847 tons and foodgrains rice. Though the scheme was discontinued, general propaganda is being continued.

Fodder.—Proper feeding of cattle, as an aid to farming received adequate attention. Raising of suitable fodder crops, annual and perennial, were demonstrated in all districts during the year the following quantities of fodder seed and planting material were distributed.

Fodder crop seeds, cholam, maize, Lucerne, etc.	41½ tons.
Fodder grass slips	6,47,187 number.

XV. HILL TRIBES UPLIFT SCHEME.

Free supply of paddy and other seeds to Yenadies in Chittoor district.—In G.O. Ms. No. 1078. Food and Agriculture, dated 2nd July 1952, Government sanctioned a sum of Rs. 4,800 for the free distribution of paddy and other seeds to the Yenadies in the reclamation colonies in Chittoor district, during 1952-53. Out of this allotment, a sum of Rs. 4,557-2-10 was actually spent. Particulars of the seeds distributed, area covered and the number of Yenadies benefitted are furnished below:—

Details.								
Serial number and variety.	Quantity distributed.		Value.			Area covered.		Number of yenadies bene- fitted number.
	TONS.	LB.	RS.	A.	P.	A.	O.	
1 Paddy	8	283	2,856	2	6	357	61	299
2 Ragi	..	1,726½	324	8	0	256	25	219
3 Horsegram ..	3	384	1,376	8	4	387	10	254
Total	12	153½	4,557	2	10	1,000	96	772

The scheme is being continued in 1953-54 also, as sanctioned in G.O. Ms. No. 1038, Food and Agriculture, dated 30th June 1953.

Welfare of Todas in Nilgiris.—In G.O. Ms. No. 885, Food and Agriculture, dated 1st March 1951, a sum of Rs. 17,500 was sanctioned to improve the condition of the Todas in the Nilgiris district and a special Agricultural Demonstrator was also appointed to look after the welfare of Todas. From the above amount, a sum of Rs. 13,400 was allotted as advance to the Todas to purchase seed potatoes, vegetable seeds,

manures and implements, and recovered from the produces. The details of advance sanctioned in the above Government order is furnished below :—

Variety of seed.	Value allowed.
	RS.
1 Seed potato 150 bags	6,750
2 Manures 150 bags	6,000
3 Cost of vegetables and other seeds	250
4 Cost of implements	400
	13,400

The above scheme is being continued as sanctioned in G.O. No. 817, Food and Agriculture, dated 27th May 1953, for one year from 1st March 1953.

DEMONSTRATION ON FARMERS' OWN LANDS.

Convincing ocular demonstration on farmers' own lands is the best method of impressing the ryot regarding several improvements. During the year, the following demonstrations were conducted on ryots' lands :—

	Numbers.
Economic planting of paddy	38,710
Paddy seed treatment	31,280
Improved ploughs	10,074
Other improved implements	9,701

Eight thousand three hundred and fifty demonstration and trial plots were laid on ryots' lands on cultural, varietal and manurial improvements during the year. Eleven thousand three hundred and eighty-nine spare parts for ploughs and other implements were sold during the year.

AGRICULTURAL ASSOCIATIONS.

Associations of farmers were organized to help in the rapid spread of Agricultural improvements. What some farmers achieve in practice the others copy easily. Twenty three thousand two hundred and one Agricultural Associations were organized during the year. Twenty-two thousand five hundred and ninety-three meetings of these associations were held.

EXHIBITIONS.

At the time of important local festivals and functions, in the districts, exhibitions were conducted to give wide publicity to improvements in Agriculture and the aids given to the farmers. Two hundred and forty-seven exhibitions were conducted during the year. Besides putting on show improved seeds of crops pest control appliances, posters and other exhibits, literature on several improvements were distributed and demonstrations were conducted in the Exhibition grounds.

XVI. AGRICULTURAL MARKETING.

Market surveys.—No fresh marketing survey was conducted during the year. The material for the following market surveys were made up to date, namely rice, millets, pulses, turmeric, pepper, groundnuts, gingelly, castor, tobacco, sugarcane and chillies. Supplementary information for marketing surveys relating to Ghee and other milk products, animal fats, and by-products, palmyra fibres was collected and furnished to Agricultural

Marketing Adviser to Government of India, New Delhi. Work regarding market surveys continued side by side with the development programme. Data on the cost of cultivation of many of the important crops were collected in the major growing districts. Towards the close of the year revision of the market surveys on Tapioca, Wool, Hair, and Lac was taken up.

2. *Grading of commodities*—(1) *Ghee.*—A new grading station for ghee was opened at Coimbatore. Altogether there are six grading stations for ghee one each at Guntur, Ongole, Madurai and Coimbatore and two at Tiruppur. Ghee was available for grading in larger quantities this year as compared to 1951-52 as a result of the seasonal conditions improving. The quantity of ghee graded during 1951-52 was 6,583 railway maunds valued at Rs. 12.1 lakhs and increased to 10,695 railway maunds valued at 18.6 lakhs of rupees during 1952-53. The graded ghee from Madras had a favourable market in Calcutta, Bombay and Delhi.

(2) *Eggs.*—There were six authorised packers for grading hen eggs, four at Madras City, one at Katpadi and one at Ootacamund. During 1952-53 9.01 lakhs of eggs valued at Rs. 1.07 lakhs were graded as compared to 11.26 lakhs of eggs valued at Rs. 1.38 lakhs in 1951-52. The fall in grading has resulted from lack of sustained demand for the graded produce and to a small extent due to the waning of interest among the authorized packers.

(3) *Oranges.*—The grading of Sathukudi oranges by the Kodur fruit growers Co-operative Society, Rajampet, showed poor progress owing to the low quality of the produce in the tract on account of acute scarcity conditions and also to the unsound financial position of the Society. In 1952-53 8,450 fruits valued at Rs. 1,141 were graded as against 22,000 fruits valued at Rs. 2,300 in 1951-52.

(4) *Potatoes.*—The grading of potatoes on the Nilgiris during 1952-53 was continued and a total of 16.9 thousand railway maunds of potatoes valued at Rs. 306.8 thousands were graded as against 8.8 thousand railway maunds valued at Rs. 128.4 thousands during 1951-52.

(5) *Other produce.*—Preliminary arrangements to start grading of limes and rice during the coming year were made during the year. The grading of sunnhemp fibre and cigarette tobacco continued to be carried out by the staff of the Inspectorate under Government of India. The quantity and value of tobacco graded as furnished by the Chief Inspector of Tobacco Grading, Guntur, was as follows :—

Type.	Quantity in million LB.	Value in RS. (IN LAKHS).
	1952-53.	1952-53.
Flue cured Virginia	72.44	9,58.41
Sun cured Virginia	0.93	5.58
White Burley	0.98	11.58
Sun cured Natu	9.42	1,03.26
Juffy	0.37	0.90
Total ..	84.14	10,79.73

(6) Excluding tobacco, the value of produce graded under Agmark in Madras State, was Rs. 22.74 lakhs in 1952-53 as against Rs. 14.80 lakhs in 1951-52. The details are given in Appendix No. 5.

3. *Regulated markets.*—(1) During the year North Arcot district was notified as a regulated market for groundnuts under the Madras Commercial Crops Markets Act. The Market Committee set up for the purpose of enforcing the Act has not started functioning. A further step was taken by the Government of Madras in notifying tobacco in Coimbatore district, cotton and gingelly in South Arcot district under the Act and placing the control of regulations in respect of these crops in charge of the market committees functioning in these districts. Proposals for extending the area of the Nandyal Market Committee to cover the entire Kurnool district and to notify control over buying and selling in respect of groundnut in Guntur, Visakhapatnam, and Srikakulam and over tobacco and groundnut in Tiruchirappalli district are under consideration.

(2) The validity of the Madras Commercial Crops Markets Act, 1933, was challenged by a number of merchants from several districts through Writ Petitions in the Madras High Court. The High Court has held that section 5-4 (a) of the Act is void to the extent that it confers on the Collector power to refuse licence at his own discretion, that Rule 37 of the Madras Commercial Crops Marketing Rules is void in so far as it prohibits persons whose names have not yet been registered as buyers and sellers from carrying on business in a notified area and that subject to this, the Act and Rules must be upheld under Article 19 (6) of the constitution as a valid plea of marketing legislation.

(3) The work of individual market committees is summarized below :—

(a) *Coimbatore Market Committee.*—Owing to the adverse seasonal conditions, during the growth period the production of cotton in Coimbatore district was considered to be the lowest on record within the past few years. The total arrivals into the market at Tiruppur this year was more than last year as given below. The excess quantity represents arrivals from outside the notified area.

Cotton arrivals into the market limits at Tiruppur—

Year.	Lint in Candies. (784 lb.)	Kapas in Pothis. (280 lb.)
1949	6,511	230,916
1950	2,180	177,115
1951	4,051	139,368
1952	8,303	191,787

All the purchases and sales within a radius of five miles of Tiruppur continued to be restricted to the Committee's market at Tiruppur. Every merchant was provided with a godown within the market. The Committee is proceeding with arrangements to set up new markets at Pollachi, Erode and Gobichettipalayam and these yards are expected to start functioning from next year onwards. A daily market report of the Committee, containing information regarding the daily prices of lint, kapas and seeds of the local market and the cotton price of New York and Bombay Markets was issued regularly. This is one of the Committees affected by the Writ Petitions and progressive work was held up as a result of the injunction by the High Court.

(b) *Bellary Market Committee.*—At Adoni, the construction of a new block of 16 godowns was taken up during the year and is nearing completion. With this there will be two blocks of 32 godowns available for the use of traders and Commission Agents in the Adoni Market. As at Tiruppur the sale of cotton and groundnut within a radius of five miles of Adoni was restricted to the Committee's Market at Adoni. Negotiations to acquire sites for construction of markets at Bellary, Kottur, and Yemmiganur were in

different stages of progress. The total arrivals of cotton and groundnut during the year 1952, at Bellary and Adoni as compared to arrivals in 1951 are given below :—

	1951.		1952.	
	Adoni.	Bellary.	Adoni.	Bellary.
Groundnut pods (bags)—				
Mungari	450,623	181,493	683,881	167,210
Kapas (dokras) ..	6,722	11,769	10,720	9,817
Farm Kapas (dokras).	60,836	10,773	53,416	12,946
Mungari Lint (dokras).	824	1,229	1,421	1,263
Farm Lint (dokras) ..	24,626	7,935	24,861	7,897

(c) *South Arcot Market Committee.*—The total arrivals of the crop in 1952 to all the eight markets came to 42,760 tons of groundnut kernels as against 49,990 tons in 1951. The details of arrivals of groundnut kernels in the different market yards are given below :—

Name of the market yard.	Notified area.		Non-notified area.	Total.
	From growers.	From traders.		
Cuddalore	5,614	84	..	5,698
Villupuram	9,429	60	..	9,489
Tindivanam	4,764	53	977	5,794
Tirukkoyilur	4,235	129	198	4,562
Ulundurpet	491	7	..	498
Vriddhachalam ..	5,617	166	6,978	12,761
Panruti	3,517	232	..	3,749
Chinnasalem .. .	169	28	12	209
Total	33,836	759	8,165	42,760

The arrivals to the markets formed 92.6 per cent of the arrivals to the market centres.

Prices paid for the crop at Committees' Markets were generally higher and consequently large quantities were brought, voluntarily by the growers themselves for the sale even in lots of small quantities without any statutory compulsion as in the markets of Bellary, Coimbatore and Guntur Market Committees.

(d) *Guntur Market Committee.*—Auction sales were conducted in the Committee's Markets at Guntur and Mangalagiri, in spite of several difficulties and unfavourable atmosphere and the results are not discouraging. The market at Thadikonda commenced working during 1953 tobacco season. The quantities of tobacco sold by auction cash and by private treaty on credit at Guntur and Mangalagiri markets during 1952, were as follows, totalling 10.21 million pounds :—

	Quantity in (000 lb.)			
	By auction.		By private treaty.	
	Guntur.	Mangalagiri.	Guntur.	Mangalagiri.
Flue cured virginia ..	241	297	3,395	2,110
Sun cured virginia ..	1,092	389	206	35
Sun cured country ..	1,171	4	1,147	10
White burley	..	..	23	..
	2,504	690	4,771	2,246

The percentage of tobacco sold by auction decreased at Guntur during 1952 to 34 from 36 in 1951. At Mangalagiri also the quantity of tobacco sold by auction to the total transaction was only 24 per cent in 1951. Exports of tobacco outside the notified area during 1952 were as follows:—

(Quantity in railway maunds.)			
	Flue cured Virginia.	Sun cured Virginia and Country.	Gulla.
1951	648,691	444,548	160,353
1952	648,407	562,616	243,198

The increase in the quantity exported is due to the large quantities of inferior grades of tobacco including accumulation.

(e) *Nandyal Market Committee*.—This is the only committee in Madras State having a jurisdiction over a municipal area while all the others are district committees. The construction of godowns in the market yard and office has not yet been completed during the year as the required iron and steel materials were received very late in the year. The daily market rates were published for cotton and groundnut. The total arrivals of cotton and groundnut into the market were as follows:—

Year.	Cotton kapas kuntalams of 1,680 lb.	Cotton lint borahs.	Groundnut pods candies of 500 lb.	Groundnut kernels candies of 531 lb.
1950	9,837	1,990	52,932	10,350
1951	7,687	1,402	48,473	21,618
1952	4,657	381	66,314	2,541

The heavy fall in the arrivals of groundnut kernels is due to the slump in oil trade, which resulted in traders restricting imports from outside the notified area.

(f) *Krishna Market Committee*.—Arrangements were made during the year to work a new market for groundnut at Jaggayapeta. No market was set up for tobacco. Market intelligence was published every day during the season in the markets. During 1952 the following quantities of tobacco and groundnuts were handled in the notified area:—

	1951.	1952.
Flue cured virginia (lb.)	11,044,857	10,935,970
Sun cured virginia (,,)	436,197	687,780
Flue cured gulla (,,)	937,580	2,008,754
Natu (country tobacco) (lb.)	5,639,339	11,511,346
Groundnut pods (tons)	42,130	7,614
Groundnut kernels (tons)	24,130	35,944

(g) *Anantapur Market Committee*.—Sanction for acquiring the four sites at Guntakal, Kadiri, Hindupur and Tadpatri selected during 1951 was awaiting from the Government. The arrivals of cotton and groundnut in the various markets during 1952 were as follows:—

	Anantapur.	Guntakal.	Tadpatri.	Kadiri.	Hindupur.	Total.
Western lint bales of 392 lb.	..	14,335	9,548	..	..	23,883
Groundnut kernels tons.	5,986	5,482	4,956	5,900	4,369	26,793

(h) *The East Godavari Market Committee*.—The committee has decided to postpone the starting of the markets till 1954, purchasing season after the formation of the full committee, as at present the committee is in the

charge of the Collector of the district. This committee also was handicapped by the stay order of the High Court in the writ petitions referred to earlier.

(i) *The Malabar Market Committee*.—Though the opening of markets at Kozhikode, Ponnani, Badagara and Chalissery were sanctioned by the Government none was opened during the year as suitable sites available for acquisition were still being searched for. However towards the close of the year as a preliminary to the opening of a market sub-offices were opened at Badagara and Ponnani. Steps were taken to standardise weights used in copra and arecanuts trade. Market information was published periodically regarding arrivals, stocks and prices. This committee was also subject to the injunction of the High Court based on writ petitions from local merchants.

(j) *The South Kanara Market Committee*.—There was no market run by the committee. A rented godown with storage and sale facilities was provided in Mangalore where produce to a very limited extent arrived for disposal as detailed below:—

	Quantity received.
Areca nut (cwt.)	250
Coconuts (Nos.)	11,235
Copra (candy of 660 lb.)	1

(k) *Tirunelveli Market Committee and (l) Ramanathapuram Market Committee*.—The first nominated committee began to function from the end of 1952, and the by-laws of the committee were framed and approved. The committees have not started functioning properly as the required administrative staff and secretary have not yet been appointed and as their activities were stayed in the High Court injunction based on writ petitions from local merchants.

4. The marketing staff helped in the day-to-day work of the market committees as framing of by-laws, arrangement of sales and auctions, general improvement of the market, etc. The functions and work of the market committees were closely watched and properly guided by the State Marketing Officer.

5. *Market Intelligence service*.—(1) Enquiries from growers' co-operative societies and members of the trade regarding better marketing of their produce were attended to. A directory of merchants as well as growers was maintained and addresses were furnished to parties, when required. In this way 50 enquiries were dealt with in the course of the fasli year 1952-53.

(2) Fortnightly prices of all Agricultural commodities were maintained at Madras, Tiruchirapalli, Madurai, Kakinada, Rajahmundry, Cuddapah, Bellary and Coimbatore. Prices of agricultural commodities like jute, sun-hemp, jaggery, sugar, arecanuts, etc., were furnished to the Economic Adviser. Stocks of foodgrains in important markets were also furnished to the Economic Advisor to Government of Madras. Weekly prices of milch cattle at Tiruvottiyur, vegetables and eggs at Madras City were also furnished. A monthly review of market conditions and a special report on decontrol of foodgrains and its aftereffects were prepared as ordered by the Government. Fortnightly review of cotton situation was also submitted. Special reports were furnished for sugarcane, onions, chillies and cotton periodically when required.

6. *Co-operative marketing.*—The marketing staff contacted important co-operative societies and helped them in the better marketing of the produce of members. Among the co-operative societies that received attention were the Provincial Co-operative Marketing Society, the Katpadi Co-operative Marketing Society, the Kodur Fruit Growers Co-operative Society, Ponnani Arecanut Society, the Tirupattur Co-operative Marketing Society (Ramanathapuram district) and Tanjore Co-operative cotton marketing society.

7. *Market legislation.*—A number of suggestions were covered in amending the by-laws of the market committees and the various rules under the Madras Commercial Crops Markets Act. The Madras Warehouses Rules 1953 were published in April 1953.

The Five-year Plan of India, has been accepted by the Government during December 1952. The chief feature of the plan is its emphasis on agriculture on which about 39 per cent of the total amount of 2,009 crores of rupees is to be utilised directly or indirectly. This plan is the first of its kind formulated by any non-totalitarian country and apart from fixation of production targets for agriculture and industries, it deals with a number of subjects as development of ports, roads and cottage industries, regulation of wages, tenancy reform and increasing social amenities and standards of living which will open out avenues for work and responsibilities for people in all walks of life.

During the year, due to the large production of cloth, the Government have successively abolished all controls on movement and marketing of cloth. The Government have also abolished controlled market for sugar and the entire production is now being marketed in the free market.

An important step of Agrarian Reform taken by the Government of Madras during the year was the Tanjore Tenants Ordinance, replaced subsequently by an Act of the Legislature which was meant to improve the relation between the landlords and tenants in the district. This Act was subsequently extended to Chidambaram taluk in South Arcot district. Though control and rationing of foodgrains was abolished from 7th June 1953 with zonal restrictions on movement, the Government of Madras procured limited quantities of paddy on a levy scale under the Madras Levy Procurement Order to build up the buffer stocks of the State from the surplus paddy growing districts of the State.

8. *Work done on behalf of the heads of departments and other States.*—(1) Supply of data on miscellany of subjects relating to production, supply, movement, prices, etc., as also on some economic aspects relating to the above has been one of the important functions of this section. Data furnished in this way to the Director of Agriculture, Madras is treated as a part of the regular duties of the department.

(2) On behalf of the Commissioner of Civil Supplies many samples of rice and paddy were analysed and opinion was offered as to quality. Special milling tests were conducted with Tanjore paddy at Kumbakonam and Mayuram to determine the percentage outturn of rice to paddy. The exportable surplus of onions, chillies and jaggery were worked out. Exports of chillies to Bengal and Bihar and the factors affecting quality and deterioration of sugar and the position of sugar in controlled and open market transactions were furnished. Fortnightly reports on the migration of cattle to neighbouring states were also submitted.

(3) Information regarding production and imports of groundnut oil in the West Coast, production of fleshings for glue factories, sampling methods

for oil seeds availability of Kamala oil and estimated production and requirements of wool in Madras State, were supplied to the Director of Industries and Commerce, Madras. A report regarding the trade centres and commodity markets in Madras State was also furnished to him.

(4) Information was furnished to the Economic Advisor to the Government of Madras regarding the various uses to which substitute fibres for jute are put to, area production and consumption of flue-cured tobacco, availability of Khandasari sugar and targets of production and consumption of dairy products and fisheries besides information relating to production, consumption, etc., for a number of other commodities. Monthly wholesale prices of fruits, vegetables and most products were furnished regularly from the latter half of the year.

9. *Transport.*—Export and import data were collected from customs records and important railway stations for the various commodities. The State Marketing Officer attended the meetings of the Southern Railway Advisory Committees. Road traffic by lorries is assuming great importance and want of collection of data relating to road and canal movements is at present a grave handicap in the work of the section.

10. *Review of prices and marketing conditions.*—(1) The deficit in India's balance of trade of 1951 of Rs. 93½ crores as compared to a positive balance of Rs. 57½ crores in 1950 is a discouraging feature. The United Kingdom restricted her import trade and the trade balance of India with United Kingdom declined considerably in the first nine months of 1952. As a result of industrial development, which took place during the World War and its aftermath, India has now emerged as a principal exporter of manufactured articles.

(2) The slump which set in towards the close of the year 1951-52 in the markets improved gradually towards the end of 1952 and by the end of the year 1952-53 the general trend of the market became firm.

(3) Even after the decontrol the prices of paddy and rice did not shoot up to unprecedented levels during the year except for a short period in the early part of the year and rice was freely available in all the markets. The control over release for sale and distribution of sugar was maintained even after abolishing sale of sugar in controlled market, to keep down the prices of sugar from increasing to abnormal levels. But towards the close of the year, the sugar prices have been on the increase due to some hoarding and freezing of sugar stocks by some leading businessmen. To bring down once again the sugar prices, the Government of India have decided to allow imports of foreign sugar into India.

(4) Conditions bordering on famine prevailed in Madurai, Ramanathapuram, Chittoor, Cuddapah and Kurnool and were successfully tackled by the Government.

(5) The course of prices of important commodities during 1951-52 is summarised below :—

(a) the prices of rice fluctuated within narrow ranges bound up with the stocks with the producers the fluctuations being more pronounced in deficit districts. The prices of millets also fluctuated within narrow limits. Blackgram at Tirunelveli which was sold at Rs. 26-13-0 per imperial maund in July 1952 increased to Rs. 30-3-0 per maund in December 1952 but subsequently came down again to Rs. 26-10-0 in June 1953. The redgram dhall and greengram dhall at Madras increased from

Rs. 23-4-0 and Rs. 22-4-0 per imperial maund respectively in July 1952 to Rs. 26-13-0 and Rs. 25-10-0 per maund in December 1952 and like blackgram fell down to Rs. 24-3-0 and Rs. 21-4-0 per maund respectively by July 1953.

(b) Cane jaggery prices increased from Rs. 11-4-0 to Rs. 23-0-0 per imperial maund at Bellary, Rs. 13-9-0 to Rs. 22-2-0 at Cuddalore, Rs. 8-8-0 to Rs. 22-0-0 at Vellore, Rs. 13-4-0 to Rs. 29-6-0 at Coimbatore, Rs. 11-4-0 to Rs. 22-8-0 at Chittoor and Rs. 6-6-0 to Rs. 22-15-0 at Vizianagaram during the course of the year.

(c) The tendency of cotton prices in Tiruppur was bearish during July to December 1952 and bullish during January to June 1953. Depression in the market during the latter half of the year 1952 was due to world wide slump. The ascent of prices in 1953 is due to the smallness of the crop. Cotton kapas prices per Imperial maund in Tiruppur fell down and touched Rs. 28-8-0 for Cambodia and Rs. 27-10-0 for Karunganni respectively in December 1952 but later improved and closed at Rs. 36-0-0 and Rs. 31-10-0 respectively in June 1953. Cambodia cotton lint, in terms of imperial maund came to be sold at Rs. 85-5-0 at Tiruppur during the period under review and closed at Rs. 96-3-0 towards the close of the year. At Adoni, the prices of lint and kapas had been increasing steadily during the year. Farm lint prices per imperial maund increased from Rs. 70-4-0 in July 1952 to Rs. 80-13-0 in June 1953 and farm kapas from Rs. 26-0-0 per imperial maund in July 1952 to Rs. 30-5-0 per maund in June 1953.

(d) The groundnut kernel market was firm throughout the year, except in the months of November and December, when the market eased a little and prices also came down slightly. At Cuddalore groundnut kernel, which was selling at Rs. 20-8-0 per imperial maund in July 1952 fluctuated within narrow limits, with an upward trend and finally closed at Rs. 31-11-0 per imperial maund in June 1953 while at Adoni, the prices increased from Rs. 20-15-0 in July 1952 to Rs. 34-1-0 per imperial maund in June 1953. Groundnut oil prices also increased from Rs. 45-10-0 per maund at Madras to Rs. 71-4-0 per maund towards the end of the year and at Cuddalore from Rs. 43-7-0 per maund to Rs. 58-3-0 per maund by the end of the year. The prices of Punasa gingelly seed at Vizianagaram increased from Rs. 27-10-0 to Rs. 37-8-0 per imperial maund and at Tiruchirappalli from Rs. 28-10-0 to Rs. 37-8-0 to Rs. 32-15-0 per imperial maund. Castor seed at Bellary increased from Rs. 18-1-0 to Rs. 24-1-0 per imperial maund. Copra office quality at Kozhikode which was sold at Rs. 42-5-0 per imperial maund in July 1952 was fluctuating within narrow limits and was sold at Rs. 41-8-0 in December 1952 but later improved and increased steadily from January 1953 and closed at Rs. 47-10-0 in June 1953. Coconut oil at Mangalore increased from Rs. 65-6-0 per imperial maund in July 1952 to Rs. 70-8-0 in November 1952 but had a slight fall in December 1952 to Rs. 66-5-0 per imperial maund and later increased to Rs. 76-6-0 per maund in April 1953, but closed finally at Rs. 74-15-0 in June 1953. Coconuts husked at Tellicherry fell down from Rs. 110-0-0 in July 1952 to Rs. 100-0-0 per 1,000 nuts in October 1952, but improved later to Rs. 160-0-0 in April 1953 and finally ceased a little and closed at Rs. 150-0-0 per 1,000 nuts in June 1953.

(e) Tamarind, which was sold at Rs. 16-6-0 per maund in July 1952 increased to Rs. 22-15-0 per imperial maund in June 1953 and turmeric prices at Guntur rose up from Rs. 14-7-0 to Rs. 31-4-0 per maund during the year.

(f) The prices of virginia tobacco per imperial maund at Guntur market was Rs. 45-4-0 during the major part of the year, rose up to Rs. 55-9-0 from April 1953 onwards, while the price for local variety of tobacco which increased from Rs. 35 in July 1952 to Rs. 43-4-0 by November 1952 fell down to Rs. 35 again by June 1953. At Rajahmundry, it fell down from Rs. 115-8-0 in July 1952 to Rs. 98-12-0 in December 1952 and was steady at that level till the close of the year. Prices at Tiruchirappalli for local variety of tobacco increased from Rs. 76-4-0 to Rs. 122-8-0 from July 1952 to May 1953 but closed at Rs. 112-8-0 per imperial maund.

(g) Arecanuts at Mangalore which was selling at Rs. 90-5-0 (husked) per imperial maund in July 1952 increased at Rs. 99-1-0 in September 1952 slightly declined to Rs. 94-10-0 in November 1952 but increased later and closed at Rs. 145-2-0 per maund in June 1953. Pepper at Kozhikode (Wynaad) which was sold at Rs. 458-10-0 per imperial maund in July 1952 had a heavy fall during the latter half of the year 1952 and was sold at Rs. 288-1-0 per imperial maund in January 1953 but the market improved later and the prices recovered steadily and finally closed at Rs. 399-13-0 per maund in June 1953. The cardamom market at Mangalore for Mysore quality had a set back during the year and the prices dropped from Rs. 741-1-0 to Rs. 426-2-0 per imperial maund during the period July 1952 to June 1953. The chillies Market showed a downward trend during the later half of 1952 and prices dropped from Rs. 42-12-0 in August 1952 to Rs. 36-14-0 per maund in December 1952 at Guntur and from Rs. 57-7-0 in October 1952 to Rs. 47-3-0 in January 1953 in Tirunelveli market but later recovered considerably and closed at Rs. 72-7-0 per imperial maund and Rs. 63-4-0 per maund in Guntur and Tirunelveli markets respectively.

(h) The situation can be summed up by saying that the prices of all commodities showing a downward trend in July to December 1952 period improved considerably in January 1953 to June 1953 period except in the case of a few commodities which had a slump in prices.

(i) The Economic Adviser's Index number of wholesale prices of foodgrains and commercial products in Madras State were as follows:—

(Base—Prices on 21st August 1939=100.)

					Food-grains.	Commercial products.
1949	..	..	..	..	378	534
1950	..	..	..	..	366	637
1951	..	..	..	..	375	673
1952	..	..	..	..	407	505
1953	January	..	..	..	424	597
	February	..	..	..	429	528
	March	..	..	..	442	564
	April	..	..	..	442	576
	May	..	..	..	441	601
	Jun	..	..	..	439	615

The prices of foodgrains increased considerably but fell down again from May 1953, while on the other hand the prices of commercial products, has been steadily showing an increase as can be seen from the Monthly index numbers for Wholesale Prices during 1953.

XVII. LEGISLATION AND STATISTICS.

Weekly Cotton-Mill and Press Returns.—In accordance with Section of the Cotton Ginning and Pressing Factories Act, 1925, the ginning and pressing factories and the Mills in the State have been submitting weekly returns in the prescribed forms. The weekly statistics are compiled and published in the *Port St. George Gazette*. Copies of these weekly statement are also being sent to the Economic Adviser, Government of India, New Delhi, the Secretary, Indian Central Cotton Committee, Bombay and the Secretary, East Indian Cotton Association, Limited, Bombay.

Cotton Transport Act.

Annual general licences.—Sixty-six licences with 1,937 certified copies were issued to the mills for the transport of ginned cotton for the purpose of manufacture during the year from 1st February to 30th June 1953 as against 62 licences with 2,711 certified copies issued during the previous year.

Single licences by sea from 1st July 1952 to 30th June 1953.—During the year, 221 sea licences were issued for the import of ginned cotton. These licences were for the import of 95,945 bales of 392 lb. each of ginned cotton for the purpose of spinning.

Single licences by road.—Sixty one licences were issued during the year for the transport of 1,917,370 lb. of ginned cotton in the protected areas and 43 licences were issued for the transport of 376,000 lb. of cotton waste and mill sweepings in the protected areas for Cambodia and Tinnevely.

Single licences by rail.—Twenty-one single licences were issued during the year for 687,982 lb. of ginned cotton to licences for 14,361 lb. of unginned cotton (Kapas) and 183 licences for 26,129,092 lb. of cotton waste and mill sweepings, to spinning mills, dealers and exporters for transport into the protected areas notified under the Cotton Transport Act. Besides this a single licence has been issued to import 158 bags of cotton seeds into Tinnevely area for purposes of cattle food. The details of licences issued for the transport into the respective areas are given below:—

A. Cambodia Area.			
Number of licences.	Kind of cotton.	Quantity. LB.	Purpose.
171	Cotton waste and mill sweepings.	2,555,732	Cleaning, willowing-pressing and export.
18	Ginned cotton ..	633,782	Spinning yarn.
2	Unginned cotton (kapas).	166	Sale.
B. Tinnevely Area.			
10	Cotton waste and mill sweepings.	50,000	Cleaning, willowing-pressing and export.
3	Ginned cotton ..	54,200	Spinning yarn.
2	Unginned cotton (kapas).	14,195	Sale.
1	Cotton seeds ..	158 (bags).	Cattle food.
C. Western Area.			
2	Cotton waste and mill sweepings.	23,360	Pressing.

The Madras Cotton Control Act, 1932 (Act XVI of 1932).

This Act has been repealed and the Madras Cotton Control Act, 1952, is in force in its place.

Certification scheme.—With the object of getting exemption from price control for superior cottons grown in the State, Certification Schemes were sanctioned in 1950-51. As the schemes proved popular, they were continued in 1952-53 also as per G.O. Ms. No. 3925, Development, dated 11th September 1952. A certification officer of the Status of the Assistant Cotton Specialist aided by the Gazetted Assistant, 6 Inspectors, 10 Fieldmen and 10 maistris were in charge of the scheme.

The Certification Scheme helped growers of superior cotton to get better prices. Besides, it kept in check the malpractices of adulteration of inferior with superior cottons and helped to maintain the purity of the latter. The co-operation of the grower, the trader and the gin and press owners is quite essential for the success of the scheme.

Proposals have been submitted to Government for realignment of the present boundary between the Tinnies and Cambodia areas to run through main roads where effective check by the Police could be made. Orders are awaited.

The Madras Agricultural Pests and Diseases Act.

The Act was in force during 1952-53 for eradication of following insect pests and diseases:—

- (1) Stem weevil and pink boll worm on Cambodia and Pachanadan cotton in the districts of Coimbatore, Tiruchirappalli, Salem and Madurai.
- (2) Hairy caterpillar pest in North Arcot district.
- (3) Cattlefly (*Stomoxys calcitrans*) in Siddhout and Cuddapah districts.
- (4) Sugarcane smut and bore in Karur taluk of Tiruchirappalli district (from 7th March to 6th September 1953).
- (5) The Pest Act enforced against budrot of palmyrah and coconut palms in Malabar, Krishna and West Godavari Districts was discontinued on 21st January 1953.
- (6) The Pest Act enforced on the Nilgiris against white stem borer of coffee was discontinued on 30th September 1953.

The Madras Sugar Factories Control Act, 1949.

The Madras Sugar Factories Control Act, 1949, provides for licensing of sugar factories and regulating the supply of cane and the price of sugarcane used in such factories, etc. An Amendment Act of 1952 (Act No. IX of 1952) has been passed to the Madras Sugar Factories Control Act, 1949. The Act was applied from October 1949 onwards in the districts of Visakhapatnam, East Godavari, West Godavari, Krishna, Bellary, South Arcot, North Arcot, Salem, Coimbatore, Tiruchirappalli, Madurai, Chingleput and Tanjore. The Director of Agriculture functioned as Sugarcane Commissioner under the Act. Fifteen factories got licences but 12 factories worked during the year, out of which one factory worked for a very short time.

2. Advisory Committee.—There were three meetings of the Advisory Committee, constituted in the course of the year to consider the amendment proposed in the Madras Sugar Factories Control Act, 1949 and the passing of freight advantage, etc., on sugar, to the cane suppliers in the form of payment of additional cane price, worked out according to SISMA formula. The proceedings of the meetings were communicated to Government.

3. Special staff.—For efficient administration of the Acts and rules, Government sanctioned the appointment of one Cane Development Officer at Madras, one Sugarcane Inspector at Visakhapatnam with one lower division clerk and a peon, and three upper subordinates each

to assist the Superintendent, Sugarcane Liaison Farm, Kulittalai, Nellikuppam and Samalkot in the day-to-day enforcement of the Madras Sugar Factories Control Act, 1941.

One upper division clerk, one typist and one peon were sanctioned in the office of the Director of Agriculture, Madras, to cope up with the increase in work due to the operation of the Act.

4. *Price fixation of sugarcane during 1952-53.*—This year also the prices payable by the sugar factories for sugarcane purchased by them was notified by the Government of India under the Sugar and Gur Control Order, 1950. The price so notified was Rs. 1-5-0 per maund (ex factory) of cane for the season 1952-53.

XVIII. SPECIAL PROBLEMS—PROGRAMME AND WORK DONE IN THE DISTRICTS.

Srikakulam.—Introduction and spread of main crop, mid-season and short duration paddy varieties, high yielding strains suitable for saline areas to replace local varieties, large scale green manuring of paddy with *Sesbania speciosa*, propaganda on Japanese method of paddy cultivation, introduction of improved AKP. strains of ragi and cumbu and also introduction of high yielding strains of AKP. 1 jonna and G1. korra were the main items of improvement work. Trials with TMV. strains of groundnut, gingelly and castor are in progress. TMV. 3 groundnut has done very well. Cultural and manurial improvements to sugarcane were widely advocated. Co. 419 cane is the outstanding variety grown in the entire area. Trials with G1. chillies are in progress. Distribution of fruit plants formed another important item of work. Soil erosion control measures were demonstrated over a large area. Two Agricultural Demonstrators were working in the agency development work at Gummalakshmipuram and Seethampeta and attended to distribution of improved paddy and ragi seeds, distribution of pesticides, manures and green manures, pest control campaigns against *spodoptera* caterpillar on paddy, mango hopper, grass hopper of paddy were conducted.

Visakhapatnam.—Early preparation of paddy seed beds, use of light iron plough, sheep penning to reduce weeds in paddy land, thin seed rate and additional nurseries, proper rotations were improvements on paddy cultivation. Growing of green manure crops of *sesbania* and *glyricidia*, application of fertilisers were other important items. The application of green manure for sugarcane, improving colour and hardness of jaggedy manufactured multiplication and distribution of improved seeds of paddy millets, bee-keeping as a profitable side line, Japanese method of rice cultivation were other important items of work done during the year.

East Godavari.—Paddy seed multiplication and distribution trials with dry paddy Bc. 130 and Adt. 22 and SLO. 15 were in progress. Saline cultures 10022 and 10034 were under trial in 3 taluks of Pithapur, Peddapur and Kakinada. Jonna Co. 2, Co. 3 and N1. ragi AKP. 2 and 6 and korra G1. were under trial. Trials with improved strains of groundnut and castor were laid. TMV. 2 groundnut was distributed for trial in rice fallows. Bee-keeping as a profitable side line showed much progress on account of the special scheme working. The campaign against budrot of palmyra and coconut was in operation. Filter point tube wells scheme was put through and the target of 95 filter point wells was easily reached. Distribution of various fruit plants formed another important item. *Sesbania* for seed and green manure was popularized over 19,400 acres.

West Godavari.—Paddy strains suitable for main and second crops and rainfed conditions were multiplied and distributed. Saline resistant type SR. 26 B was distributed. Propaganda to increase area under short-term food crops resulted in planting 5,964 acres under ADT. 3 MTU. 9 and 15 paddy strains. Paddy being the major crop of the district received attention for cultural, manurial and varietal improvements. Efforts to evolve a suitable deep-water paddy strain to withstand submersion in the Kollair lake region are being continued. Demonstrations on cultural and manurial improvement to sugarcane cultivation were conducted. Trials with TMV. 1 and TMV. 2 gingelly were a failure. TMV. 2 groundnut seed is being distributed to upland ryots. Four thousand six hundred and sixty-four coconut seedlings were distributed from the nursery at Maruteru. The tobacco strain Chatham is spreading in the district, besides, HS. 9 Virginia. The filter point tube well scheme put through during the year was successful, the target of 50 having been exceeded by 37 and 59 loans to the value of Rs. 1,46,200 were disbursed for purchase of oil engine pumpsets for use with filter points.

Krishna.—Cultural and manurial improvements on paddy formed the main items of work. Thin sown nurseries with treated seed, intensive, manuring and selection of suitable rainfed paddy strains were the important items of work. Peddakusuma culture 4688 gave extra yield of 170 lb. over MTU. 19. Deep-water paddy cultures 1311 and 1316 were tried. The former gave 150 lb. extra yield over the latter. Saline resistant cultures 10022 and 10034 were under trial. In the second crop, NX. 60 ADT. 3 and ADT. 20 were under comparative trials. TMV. 2 groundnut was grown in rice fallows.

Guntur.—Large scale production of pure seed of paddy, millets, C1. Ohillies, HS. 9 virginia tobacco, C1 and C2 cotton seed formed an important item of work in the district. Against a target of 70 filter points 107 were actually sunk in the district. Loans to the extent of Rs. 1,51,118 for the purchase of 91 engines for these filter points were disbursed. Selection of suitable paddy strains for rainfed conditions and submergible conditions formed part of the work. Trials with millets to pick out suitable strains of jonna, cumbu, ragi and varagu are programmed.

Nellore.—The effect of ammonium sulphate on the yields of paddy and ragi was studied in observation plots. Varietal trials with MTU. 19 and GEB. 24, 6994/1, 6993/4, BCP. 1 and 2, Co. 26, BCP. 1 and 2 and local, MTU. 15 and ADT. 3 and SR. 26 B are in progress. Seventy-seven filter points were sunk and loans sanctioned to 52 cultivators. There is need for evolving suitable short duration paddy varieties to suit the second season. Millets form the staple food of the upland areas, and selection of suitable improved strains of jonna and ragi are being attended to. *Sesbania* for seed and green manure was grown on 12,650 acres.

Kurnool.—Fertilising dry lands with ammonium sulphate in conjunction with groundnut cake or cattle manure was tested in various taluks. Ammonium sulphate with groundnut cake has proved beneficial on N1. jonna. Trials with improved strains of paddy, millets, cotton, chillies, groundnut, castor and pulses were conducted to select suitable ones for the district. Production of improved seeds of paddy and millets under the intensive cultivation schemes and control of pests and diseases formed an essential feature of the year's work.

Cuddapah.—Rains failed over a large area of the district and famine conditions prevailed. There was a large demand for tractors on hire for

purposes of reclamation and of oil engine pumpsets for irrigation. The demand for improved seeds of paddy, millets and cotton was keen. Nandyal jonna strains are spreading in the district. Control of pests and diseases in orchards received prompt attention.

Bellary.—Being a dry district the conservation of soil moisture by bunding, bringing fallow lands under cultivation with the aid of mechanical equipment and reclamation of virgin lands were attended to. Distribution of improved seeds received attention. Trials with paddy AKP. 2 at Harpanahalli were conducted. Jonna strains were under trial in the Hingari season. M47-3 proved to be the best. Other millets strains were under widespread trials. There are 38 privately owned tractors working in the district, as also 800 pumpsets. Special staff attended to sugarcane improvement in the district. A large quantity of prosopis seed amounting to nearly 50,000 lb. was procured for distribution to ryots as a fence crop and for fuel.

Anantapur.—This district was also badly affected by famine. Multiplication and distribution of improved strains of paddy, millets and groundnut formed an important item of work. Seed procurement was rendered difficult due to failure of rains. Special staff attended to sugarcane improvement work in the district. TMV. 3 groundnut is rapidly spreading in the district.

Chittoor.—This district was also in the grip of famine especially the taluks on the west and north. Agricultural labour migrated from the district. Small farmers were worst hit and agricultural economy was upset. Paddy seed distribution forms an important item of work. Soil conservation work was done as a famine relief measure in the district. Three thousand and seventy-nine acres were contour bunded.

North Arcot.—Intensive propaganda on Grow More Food Schemes, seed production and distribution, pest control work were the important phases of work attended to during the year. Sugarcane development work was in the hands of special staff and 391 agronomical demonstrations were done.

Chingleput district.—The most important item of work was the Grow More Food campaign under the Five-Year Plan. Forty-five filter point tube wells were installed during the year adding up 500 acres under irrigated paddy. Six ryots took part in the tapioca yield competition and a ryot of Gummidipundi produced the maximum yield of 20,900 lb. per acre. There was widespread water scarcity in the district. Three river pumping schemes are in operation in the district. A large quantity of seeds of *Gliricidia maculata* was procured for distribution to ryots in all districts.

South Arcot.—Multiplication and distribution of improved paddy and millet seeds, filter point tube wells, growing P216F cotton in the rice fallows and demonstration of mixed cropping were important items of work done. Fifty-seven filter point tube-wells were sunk during the year and loans for five oil engines to pump out water therefrom were issued. Due to adverse seasonal conditions there was a keen demand for the several Grow More Food aids. Sugarcane development work was attended to by special staff in the district.

Salem.—This district also had adverse seasonal conditions. The procurement of seeds was rendered difficult due to the lifting of controls. Trials with improved strains of crops continued. Distribution of fruit plants and irrigation aids form a special feature of the work in the district.

Tanjore.—Being a large paddy growing district, the multiplication and distribution of Grow More Food aids like manure and fertilisers, irrigation appliances, sowing cotton in rice fallows, economic planting of paddy were important items of work attended to. Against a target of 75 filter points 82 were sunk during the year and 57 oil-engine pumpsets and 1 electric motor were supplied to ryots. The intensive manuring scheme was in operation in the district. Those ryots who maintained good holdings were awarded prizes from the Collector's discretionary grant. Sesbania for seed and manure was popularized over 64,300 acres.

Pattukkottai.—Large-scale multiplication and distribution of improved paddy seeds, distribution of Grow More Food aids, sinking of filter point tube wells were the special items of work. Demonstrations on pest and disease control were done. Out of the Collector's grant 14 ryots were awarded prizes for well run holdings.

Tiruchirappalli.—Selection of a suitable strain of paddy for submersible conditions, selection of a type for saline lands and for dry taluks were in progress. Multiplication and distribution of paddy and millets seeds was an important item of work. P216F Cotton was introduced in rice fallows. Sugarcane development work is in charge of special staff in the district.

Madurai.—Popularising power lift irrigation, manure preservation and compost-making, multiplication and distribution of improved strains of paddy, millets, reclamation of waste lands, distribution of fruit plants, distribution of improved cotton seed and soil conservation work were important items attended to during the year. Filter point tube wells were sunk and loans disbursed for fitting them with oil engine or electric motor pumpsets.

Ramanathapuram.—Trials with improved strains of paddy, millets, red-gram, cotton and chillies were conducted in all taluks to select suitable ones for the tract. Improved strains of paddy, millets and groundnut were multiplied and distributed. Three hundred and twenty-nine acres of waste lands were reclaimed for cultivation.

Tirunelveli.—Multiplication and distribution of improved seeds of paddy, millets and cotton was the important item of work during the year. Large scale demonstrations on control of pests and diseases were done. Karunganni cotton seed was multiplied and distributed by special staff in the district. The intensive manuring scheme was worked in the district.

Coimbatore.—Popularisation of green manuring, multiplication and distribution of improved strains of paddy, millets, cotton and groundnut formed important features of the year's work, as also distribution of pumpsets for lift irrigation. This district has got the largest area under well irrigation. Large-scale demonstrations with improved implements and other agricultural machinery were done as also control of pests and diseases of crops. The Lower Bhavani Reservoir received about 70 feet of water during the year. About 19,000 acres are proposed to be irrigated in the next season.

Nilgiris.—Forty thousand and one hundred lb. of seed potatoes and 127 lb. of vegetable seeds were distributed. Work on control of white borer of coffee was attended to by special staff till May 1953. Distribution of improved seeds of paddy, pest control work, distribution of fruit plants, rural welfare work and help to the Tengumarahada collective farming society were important features of work during the year. Paddy work in Gudalur taluk is being intensified.

Shoranur (South Malabar).—Multiplication and distribution of improved strains of paddy land reclamation with tractors, compost-making, control of pests and diseases were the main features of work done during the year.

Tellicherry (North Malabar).—Distribution of improved paddy seeds control of pests and diseases of crops, growing green manure crops were important items of work attended during the year, as also land reclamation by tractors and bulldozers.

South Kanara.—Multiplication and distribution of improved paddy seeds, green manuring, trials with paddy cultures, ragi, cholam and samai strains were important items of work. Paddy strain MTU. 3 in place of PTB. 9 for the first crop is becoming popular. Co. 25 for second crop season under irrigation is also becoming popular on account of its high yield. S.R. 26B paddy for saline lands did not appeal to farmers on account of its long duration and damage by birds and pests. The river pumping scheme functioned in two centres in the district.

General.—Japanese method of rice cultivation campaign was conducted in all the districts as also large scale green manuring expansion of sesbania and gliricidia and filter point tube wells. Agricultural associations were organized in all the districts and regular meetings were conducted and close contact with the farming public maintained. Rural development work was pushed through in close co-operation with officers of Revenue, Co-operation, Forest, Rural Welfare, Animal Husbandry and Community Projects. Distribution of improved seeds through multipurpose co-operative societies was continued. Distribution of iron and steel and chemical fertilisers was done through village co-operative societies. The help rendered by Revenue officials in the implementation of tree-planting, intensive cultivation schemes contributed to the success of work. The District Collectors allotted funds for loans for seeds and manures. In Tanjore, the District Collector has provided funds for prizes for well maintained and run farmsteads. Close co-operation with Public Works Department Officers in the district was maintained and irrigation conferences were attended by District Officers of the department. Help was rendered to municipalities and panchayat boards for preparing compost and distribution by hiring departmental lorries for transport.

XIX. SOIL CONSERVATION.

Soil conservation scheme in the State marked a new line during the year with the famine and acute distress conditions prevailing in the Ceded districts and in parts of many of the Central districts. Although it was previously accepted that contour bunding and other linked soil and moisture conservation measures could with advantage be adopted for providing work for rural labour, this is the first year in which it was actually implemented, as such in this State with widespread distress reported from several areas.

Another important phase on an all-India basis reached in respect of soil conservation scheme is its recognition by the National Planning Commission as a necessary link in the agricultural development of the dry tracts with starting and opening of demonstration soil conservation centres in the different representative regions. It is also of interest in this connexion that an All-India Soil Conservation Society with almost all the technical administrative and scientific workers in the country was formed and this has contributed to the greater realization of the importance of soil conservation schemes in any programme of land and water development of every State generally.

Schemes were sanctioned in G.O. Ms. No. 13, Revenue (Famine Relief), dated 7th May 1952, as a famine relief measure in the district of Chittoor spread over the two taluks of Chittoor and Vayalpad covering a total area of 7,500 acres at a cost of Rs. 5.5 lakhs nearly. Similarly another famine relief soil conservation scheme was sanctioned for Dharapuram taluk in Coimbatore district in G.O. Ms. No. 70, Revenue (Famine Relief), dated 26th July 1952. Both these were taken up as emergency measures for execution with famine labour in the respective areas affected by severe and continued drought conditions and were very helpful in alleviating unemployment in these distress areas.

In the district of Nilgiris the pilot scheme proposed for an initial area of 89 acres in the Ketti Valley was sanctioned in August 1952 and taken up for execution as an item of land improvement under the Madras Land Improvement Act (1949).

The soil conservation schemes previously started in the districts of Bellary and Anantapur involving contour bunding and contour trenching were continued and the originally sanctioned acreages were completed.

Soil conservation schemes in Bellary-Anantapur districts.—With a view to further popularize contour bunding and other conservation practices and to improve the economic condition of the Ceded districts' ryots the Government originally sanctioned scheme for soil conservation in Rayalaseema. To start with, three centres of work, namely, Nagari and Alur in Bellary district and Guntakal in Anantapur district were selected on a catchment basis and this scheme came into operation on 8th August 1949. This scheme is being executed under the provisions of the Madras Land Improvement Act in the extended areas of those three select centres.

The area contour banded so far, the acreages covered during the year under report and the extents topographically surveyed are furnished below :—

Name of the centre.	Area topographically surveyed.	Area banded, up to 30th June 1952.	Area banded during the year.	Total area banded up to 30th June 1953.	Total retrenched.
	ACS.				
Hagari	6,049	915	465	1,380	78
Alur	6,910	2,040	..	2,040	..
Guntakal	6,845	1,415	..	1,415	..

No additional area for bunding was taken up at both Alur and Guntakal centres since the areas sanctioned in the original estimate were fully covered. Though Government sanction for extending the work to an area of 11,560 acres in all the three centres has been received, further bunding work could not be taken up during the fasli year under report for want of sanction to the draft scheme by the Board of Revenue under the Madras Land Improvement Schemes Act.

Famine relief schemes for soil conservation measures.—(1) A scheme for soil conservation particularly for the famine-affected areas of Kudligi and Rayadurg taluks of Bellary district was ordered to be prepared by the Famine Commissioner. Accordingly a scheme for tackling 10,000 acres in the above two taluks was prepared and submitted during the year under report. This scheme was again revised and submitted to Government. The total cost of this scheme amounts to Rs. 6,34,000. This has been deferred by the Government for consideration of the respective States after partition.

(2) Another similar scheme for red soil areas in Anantapur district was also prepared to tackle 10,000 acres in Anantapur and Kadiri taluks as a famine-relief measure. The total cost of this scheme is Rs. 6,33,200. The sanction of this scheme is still pending with Government.

(3) At the request of the Rayalaseema Development Commissioner a scheme for afforestation and turfing the K.C. Canal banks as a soil erosion control item for a ten-mile stretch as an experimental measure was also prepared and sent to Government. This scheme is proposed as a three-year scheme and the total expenditure amounts to Rs. 26,000 per annum. This scheme also is pending sanction of the Government.

Soil conservation schemes in the Nilgiris district.—To tackle the growing problem of soil erosion of a serious type in the Nilgiris district the Government have extended the provisions of the Madras Land Improvement Schemes (Contour Bunding and Contour Trenching) Act, 1949, to the Nilgiris and the adjoining hill slopes in G.O. Ms. No. 3516, Development, dated 6th September 1950.

To start with a self-defined sub-water shed comprising about 300 acres in Ketty Valley was chosen for detailed intensive survey for the preparation of the scheme proposals. In the beginning a Pilot Soil conservation scheme for an area of 88.65 acres alone in Ketty Valley was prepared and it was sanctioned by the Government in G.O. Ms. No. 3702, Development, dated 26th August 1952.

The following is the progress of the soil conservation works carried out under the sanctioned Pilot scheme :—

- (1) Area bench terraced—62.89 acres.
- (2) Area contour trenched—2.08 acres.
- (3) Area planted with grass—2.06 acres of revenue poramboke and on edges of bench terraces covering an area of 62.89 acres.
- (4) Vertical drain with stone pavements and dry rubble revetments—720 r.ft. serving 11.23 acres.
- (5) Diversion channels—Two numbers to serve 5.5 acres.
- (6) Gully plugging store well check dams—1 number.

Constitution of the Ketty Pilot Projects.—The scheme proposals together with plans and estimate for completing the selected sub-catchment area of 203.35 acres which forms the remaining portion of the sub-water shed in Ketty Valley and which lies contiguous to the area included in the sanctioned Pilot scheme have also been prepared and submitted to Government. It has been approved by the Nilgiris District Soil Conservation Board and also by the State Soil Conservation Board. This scheme is under consideration of Government for sanction.

As suggested by the Board of Revenue training classes for the Revenue Inspectors and village officers of the Nilgiris district have been instituted with effect from 15th June 1953. It is intended to impart sufficient practical knowledge in soil conservation practices as applied to the Nilgiris to the village officers and Revenue Inspectors of the district, so as to enable them to convince the ryots and do effective propaganda till every farmer becomes conservation minded. This training course is of one week's duration for each batch. In all 83 village officers and 8 Revenue Inspectors in the Nilgiris district are proposed to be trained in eight batches under this scheme.

Soil Conservation Scheme in Chittoor district.—To give relief to the rural working classes in the severely-drought affected areas, due to a series of continued adverse seasonal conditions in Chittoor District, soil conservation works as famine relief measures have been undertaken. This scheme came into operation on 29th May 1952 and is in operation in Chittoor and Vayalpad taluks with contour bunding as its main feature. The other allied protective measures, such as gully plugging surplus weirs and contour trenching are also included in this scheme.

There was initially good labour attendance of about 600 to 800 people daily for the works from the very start of the scheme till 22nd November 1952. From 23rd November 1952 onwards, on account of periodic cuts in wages ordered by the Government with the idea of diverting a great number of them in a calculated manner back to their normal agricultural avocations, as also on account of the hard type soils encountered during the course of earth-work excavation, the labour attendance for the works began to dwindle to about 200 people daily. Finally with the upgrading of the Chittoor taluk to 'C' zone under the distress classifications and the consequential cuts in the already reduced rates of wages with effect from 1st March 1953, the usual labour for the works abruptly stopped in toto and remained so for the rest of the year, as these wages were too low to earn even a single meal. The rates were revised and refixed at reasonable levels from 26th June 1953 after which the labour attendance engaged was about 100 numbers a day during the few days prior to close of the year as only some of the gaps were to be filled up in the areas tackled.

The progress during the year is as follows (important items given) :—

	Chittoor.	Vayalpad.
1 Extent of lands surveyed for alignment of bunds (in acres).	1,298.26	1,950.50
2 Extent of land contour bunded ..	1,298.26	1,950.50
3 Number of waste weirs constructed ..	195	12
4 Extent planted with seeds of trees of green manure and economic value.	220.00	209.00
5 Extent turfed with grass seeds ..	9,000	100.43
6 Area sectioned to top levels	1,044.00	1,449.61
7 Area surveyed for mapping the bunded fields.	1,265.11	1,241.03
8 Labour engaged—		
(a) Men	53,750	66,514
(b) Women	20,615	58,583
(c) Children	4,327	6,817

Soil conservation works in Coimbatore district as famine relief measures.—In G.O. Ms. No. 70, Revenue (Famine Relief), dated 26th July 1952, the Government were pleased to sanction a scheme for soil conservation to be taken up as a famine relief measure in the dry and wind-swept areas of Mulanur firkha of Dharapuram taluk in Coimbatore district which was subject to severe wind erosion. These are being carried out with contour bunding as its main feature to afford relief to the distressed and unemployed agricultural labourers by engaging a large number daily.

The details of the works done are as follows :—

- 1 Total area contour bunded during the fasli year—6,000 acres.
- 2 Sectioning of contour bunds during the year—2,042,059 r.ft. covering 6,457 acres.
- 3 Total number of labourers engaged—
 - (a) Men—121,800 numbers.
 - (b) Women—113,176 numbers.
 - (c) Children—3,865 numbers.

Rehabilitation schemes.—A scheme for carrying out soil conservation and land improvement works in an area of 4,406 acres in Kothamangalam fuel series disreserved for assignment to displaced persons under the Lower Bhavani Project was prepared and submitted to the Government. The total cost of the scheme is Rs. 2,24,556. The sanction of this scheme is still pending with Government.

The detailed scheme proposals for contour trenching and afforestation as a famine relief measure on the denuded hills of Sivamalai in Dharapuram taluk and Alagumalai in Palladam taluk and reserve forest area in Dalavaipatnam of Dharapuram taluk of Coimbatore district were also prepared by the Assistant Agricultural Engineer, Soil Conservation Scheme, Dharapuram, and submitted to the Board of Revenue through the Collector, Coimbatore. The non-recurring expenditure for these three areas are Rs. 2,000, Rs. 9,600 and Rs. 2,900 respectively and a recurring expenditure of Rs. 370 only for Sivamalai and Alagumalai hillocks. This is also pending with the Board of Revenue.

Proposals have also been submitted for taking up soil conservation works in 1,000 acres of dry land in each of the three developmental blocks in the Community Project area in Coimbatore district. The total non-recurring cost of this scheme works out to Rs. 1,55,560 and the recurring cost works out to Rs. 26,886. This scheme is under the consideration of Government.

The scheme proposals for Kangayam and Vellakovil firkas were also submitted to Government to be taken up as famine relief measure. Consequently the Board of Revenue has instructed to revise the scheme so as to take it up under regular land improvement measure as seasonal conditions are improving. Accordingly this extension scheme for Kangayam, Vellakovil and Mulanur firkas of Coimbatore district was revised and is being submitted separately.

The Government of India in their Order No. F. 74/52-GMF (S), dated 9th September 1953, have also sanctioned (a) a loan of Rs. 3,76,210 and (b) a grant not exceeding Rs. 94,052 in respect of Coimbatore contour bunding scheme (Mulanur, Kangayam and Vellakovil firkas).

Other schemes which are under preparation.—Further proposals for taking up soil conservation works in South Arcot, Cuddapah, Tirunelveli, North Arcot and Nellore districts are under preparation.

State Soil Conservation Board.—During the year under report three meetings, the fourth, fifth and sixth meetings of the State Soil Conservation Board were held and all the meetings were presided by the Minister for Agriculture. At the three meetings several schemes for soil conservation to be taken up in the State and proposals for better land utilization in the Nilgiris and other places

were discussed in addition to the review of the schemes that are in progress. Some of the salient and important features of these meetings were the consideration of the starting of soil conservation schemes for livestock farms in Madras State, need for including soil conservation schemes in the Community Project areas, contour trenching and afforestation of hills and uncultivable lands by the Revenue Department, schemes for afforestation of Kurnool-Cuddapah canal area, consideration of an Act to prevent cutting of trees in Nilgiris and the question of levying a cess or sales tax on potatoes to raise the necessary funds required for soil conservation work in the Nilgiris. The Board has in general accepted the several schemes and recommended to Government for early implementation.

XX. AGRICULTURAL ENGINEERING.

The Agricultural Engineering branch was engaged in arranging supplies of tractors on hire and hire purchase oil engines and electric motor pumpsets and accessories and work connected with the maintenance of the mechanical equipment. The work done in each one of its section is detailed below :—

Training.—The six Agricultural Demonstrators [B.Sc. (Ag.) Graduates] selected for training in the Agricultural Engineering have undergone the course for one year from 1st April 1952 to 31st March 1953 as per G.O. Ms. No. 2089, Food and Agriculture, dated 25th October 1951.

As per G.O. Ms. No. 160, Food and Agriculture, dated 8th February 1952 and G.O. Ms. No. 738, Food and Agriculture, dated 29th April 1952, Sri J. Soundara Pandian and Sri V. Chandrasekara Sastri, Agricultural Engineering Supervisors, have undergone training in the Central Tractor Organization, New Delhi, for a period of six months from 13th October 1952 forenoon.

As per G.O. Ms. No. 248, Food and Agriculture, dated 21st June 1951, Government sanctioned the conduct of training courses at Bapatla and Coimbatore in three batches for the tractor and oil engine drivers. The second and third batches commenced on 20th February 1952 and 1st July 1952 and concluded on 20th June 1952 and 31st October 1952 respectively.

There were 21 and 23 candidates in the second and third batches respectively. All these departmental candidates were posted back to the districts in which they were working prior to joining the course. Out of seven outsiders for both the second and third batches, six have been appointed as tractor cleaners after the training.

Tractor workshop.—During the year under report, Government have in their Order Ms. No. 1382, Food and Agriculture, dated 27th August 1952, sanctioned the set-up of a tractor workshop at Bellary to cater to the needs of the districts of Rayalaseema in order to carry out the major repairs, over-hauls and complete shipping of tractors and allied equipment according to periodical programmes, as in the case of the other two tractor workshops at Coimbatore and Bapatla. The Assistant Agricultural Engineer-in-charge of this workshop took charge of the post on 28th December 1952.

Oil engine and electric motors.—The scheme for supply of oil engines and electric motors under hire purchase system from the Central Agricultural Engineering Stores and Supply Centre was in operation during 1952-53. In G.O. No. 122, Food and Agriculture (Food Production), dated 27th March

1953, Government were pleased to sanction the continuance of the following staff till 31st March 1954 :—

For headquarters.

Gazetted.—One Assistant Agricultural Engineer on Rs. 200—500 per mensem.

Non-Gazetted—

Two Assistant Engineering Supervisors—Rs. 150—250.
One foreman—Rs. 85—150.
One store-keeper, Grade III—Rs. 60—100.
One accountant and two Junior Superintendents—Rs. 140—5—190.
Eight upper division clerks—Rs. 80—125.
Three lower division clerks—Rs. 45—90.
Two typists—Rs. 45—90—Special pay Rs. 10 each.
Three fitters on Rs. 30—1—50.
Two pumpset drivers on—Rs. 40—70.
One peon on Rs. 18—28.
Two attenders on Rs. 24—35.
One jeep driver on Rs. 40—2—50.

Mufassal.

Four upper division clerks on Rs. 80—110.
Twenty-one lower division clerks on Rs. 45—90.

In G.O. Ms. No. 8, Food and Agriculture (Food Production), dated 6th January 1953, Government were pleased to sanction the scheme as follows :—

(1)	Oil engine pumpsets. (2)	Electric motor pumpsets. (3)	Expenditure. (4) RS.
Intensive cultivation areas ..	500	200	25,58,580
Non-intensive cultivation areas ..	275	165	14,36,719
Total ..	775	365	39,95,299

The Government have decided that the expenditure in the intensive cultivation areas should be limited to the amount of loan sanctioned by the Government of India. Government of India have sanctioned a sum of Rs. 36,75,000 in the first instance with the promise of further assistance later if needed. It has also been decided by Government that 80 per cent of the total targeted number of the machinery should be of Indian make and the balance of 20 per cent of foreign make.

Under the above scheme 117 electric motors and 106 oil engines were purchased and supplied to ryots during the year under report, i.e., up to 30th June 1953 as shown below :—

	RS.
For 117 electric motors	62,141
For 106 oil engines	2,48,080
Total ..	3,10,121

The total amount of instalments collected during the year for the loan advanced during the previous years and the balance outstanding is furnished below :—

RS.

Total amount of instalments collected for the amounts advanced during previous year	6,69,206
Balance outstanding on 30th June 1953 including the advances during the year under report	11,67,791

During the year under review the scheme for land development by mechanical power lift irrigation by hiring of portable oil engine pumpsets in the various districts was continued. The department has on hand 767 oil engine pumpsets and almost all of them were on hire for emergency lift irrigation necessitated by non-receipt of timely rains during the season or on account of the failure of the usual means for lifting water from wells. That the demand was more than what could be met by the existing units was realized when in most of the different districts many applications could not be complied with on account of lack of sets. This is one of the most popular schemes sponsored by the department under the Five-Year Plan and has been of very great assistance to the ryots since the inception of the scheme in 1946 in saving their withering crops at the time of failure of monsoon or other unexpected handicaps to the existing means of irrigation and also to enable others to raise crops regularly on their lands where there was plenty of water available and the ryots had not the ways and means to own their own sets on a permanent basis. This assistance has directly stimulated the progressive development of small mechanically operated lift irrigation sets among ryots to a very considerable extent all over the State. In fact it may be safely said that this State leads the country in the matter of utilization of power pumping units for agricultural purposes and this is amply borne out by the recent census figures published by the Economic and Statistical Adviser to the Government after a State-wide enumeration in all the districts.

With a view to run this scheme on a 'No loss—No profit' basis and thus cut down the expenditure that is borne by the State now, the rates of hire charges for these departmental units have been revised in G.O. Ms. No. 457, Food and Agriculture (Food Production), dated 5th December 1952, as shown below :—

	With driver.	Without driver.
For oil engine set below 16 H.P. ..	Rs. 4 per day of 8 hours.	Rs. 2 per day of 8 hours.
For oil engine sets of 16 H.P. and above.	Rs. 5 per day of 8 hours.	Rs. 3 per day of 8 hours.

Orders have also been issued from this office that the work-spots should be declared as the headquarters for the drivers.

In G.O. Ms. No. 96, Food and Agriculture (Food Production), dated 12th March 1953, Government sanctioned the purchase of 60 numbers of indigenous and 15 numbers of imported oil engine units during 1952–53 in accordance with the recommendations of the Agricultural Machinery Advisory Committee. No new units have, however, been acquired during this year for the hiring scheme. There was also frequent demand from the ryots for the outright sale of some of the units that have been taken by them under the usual terms of hire and Government have permitted the sale of 25 per cent

of the hire units to the ryots. Orders have also been issued in G.O. Ms. No. 416, Food and Agriculture (Food Production), dated 26th November 1952, to give rebate to the purchaser to the extent of one-third hire charges collected on these units when they are taken on hire purchase. This took effect from 26th November 1952, the date of the Government Order. This concession was extended to outright purchasers also in Government Memorandum No. 12639, F.P. VII-A, Food Production, dated 9th January 1953. In general, the demand for power pumping is steadily on the increase and progressively developing in all the districts.

The use of small oil engine pumpsets for raising crops has taken root in the Nilgiris district also during the year. A few enterprising farmers have constructed small dams across some of the hill streams flowing through their holdings and utilized this water for irrigation with the help of these hire units supplied by the department. The demand for the same is likely to steadily go up as more ryots are now anxious to raise irrigated crops during the summer season. In like manner, there is a greater awakening among the ryots in the districts of Visakhapatnam and Srikakulam for the development of power lift irrigation and raising an extra crop in areas where only a single crop is cultivated at present. These districts are now asking for more sets for hire purposes.

Chittoor district is served by electric current supply from the Mettur-hydro-electric grid and a fairly large number of electric motor driven pumping sets have been installed by the ryots in the district for their irrigation needs. This would have been more spectacular and new units more substantial but for the prevailing power supply restrictions caused by the low water level position in the different hydro-electric systems. With a view to keep a stand-by unit for being issued on hire to ryots in case of unexpected failure of any of these electric motor pumpsets, Government have sanctioned as a pilot scheme in G.O. Ms. No. 149, Food and Agriculture (Food Production), dated 8th April 1953, the purchase of one electric motor pumpset for being stationed at Chandragiri (Chittoor) for issue on hire. The general rules for hiring of this unit are under the consideration of Government at present.

During the year, the following oil engines have been sold by the firms who are the established distributors or the manufacturers of oil engines direct to agriculturists for agricultural pumping operations on recommendations of the Agricultural department against the requests of ryots :—

Name of the firm.	Type of engines.	Number of engines sold.
1 Messrs. Textool & Co., Ltd. ..	Textool	144
2 „ Parry & Co., Ltd. ..	Petter	54
3 „ Ratliboi & Co., Ltd. ..	Ruston Daihatsu, etc. ..	57
4 „ Greaves Cotton & Co., Ltd. ..	Ruston	206
5 „ British and Eastern Engineering Company. ..	Diesel and Crude Oil engines. ..	1
6 „ Volkart Brothers ..	Lister	72
7 „ Marshall Sons & Co., (India), Limited. ..	Copper and Flower ..	87
8 „ Jayems Engineering Company	Russel Newberry Claves, Imperial Keighly, Campbell Steyr. ..	266
9 „ Cressley Bros., Ltd. ..	.. ..	2
Total ..		889

It will be observed from the above statement that there is a steadily increasing demand from agriculturists for small oil engines for pumping purposes. While in the past ryots were somewhat reticent to take the indigenous oil engines and were more insistent about the supply of foreign-made units, Indian-made engines are gradually gaining ground among the agricultural users more on a quality and durability basis than merely on a price basis as it appeared in the beginning.

There is also greater need for the proper ensuring of both after sales free servicing and standard repair facilities for the oil engine and other pumping machinery supplied to agriculturists under the different schemes of the Five-Year National Plan. In their different communications on the schemes for the supply of power pumping installations to agriculturists, the Government of India are laying special emphasis for such arrangements being simultaneously made with the manufacturers' representatives at the time of delivery of the machinery to the concerned parties so that ryots may derive maximum benefits from such units.

Cases, where the poor and ignorant cultivators are being exploited by private mechanics in respect of the pumpsets installed in the interior rural areas and charging them very high, are being reported more frequently now than during the previous years. To safeguard the interests of illiterate ryots, it has become necessary to give the requisite practical training to the agricultural owners and users on a more intensive scale than at present. This will help the ryots not only to operate and maintain their units better but also to save them from being exploited.

Petrol-driven pumpsets.—The petrol sets were also continued to be given on hire during the year under report. But the number on hire was only about 30 as the other units have become unserviceable on account of constant use. Reports have been called for as to how many of these units could be reconditioned and as to how many have to be condemned outright. Spare parts are not readily available for these machines and even where they are, the prices are on the high side as these will have to be specially imported from the dollar production centres against specific forward delivery indents.

Filter point tube wells scheme.—The scheme for sinking of 100 tube wells in Tanjore district to encourage ryots to extend paddy cultivation in Kuruvai season when sufficient water is not let in the channels for raising nurseries and to enable the cultivation of cotton or groundnut in the off seasons in the rice fallows in Tanjore district, was worked till 10th December 1952 when the target of 100 successful points was reached. Two hundred and seven attempts were made out of which 101 filter points were successful and 106 were failures.

Mr. L. B. Riggins, the well drilling expert of the F.A.O., who inspected the tube well work in Tanjore district, has expressed his opinion that excellent progress has been made though extremely primitive equipments, were being used of necessity and that the present method is probably the best under the conditions as they now exist considering the relatively low cost of installing the present filter point tube wells and the shallow depths of such wells. At the Conference held in the Chambers of the Minister of Agriculture in connection with the Pazhavar river pumping scheme, the Chief Engineer for Irrigation mentioned that, during the pre-Mettur years, lift irrigation from the streams in this delta zone was a common feature and that there can now be no real objection to any new proposals for the large scale utilization of underground waters for irrigation purposes in the Tanjore delta zone.

In G.O. Ms. No. 118, Food and Agriculture (Food Production), dated 24th March 1953, Government sanctioned the continuance of the scheme on an expanded scale for the installation of 600 filter point tube wells in the deltaic regions of Nellore, Guntur, East Godavari, West Godavari, Chingleput, North Arcot, South Arcot, Tanjore, Tiruchirappalli, Madurai, Ramanathapuram and South Kanara. The actual work was started from the 1st of April 1953 and the scheme was first in force up to 30th June 1953 only as the financial sanction granted by Government existed only up to that date, but was later extended to 30th September 1953. Government have also sanctioned Rs. 15 lakhs for issuing loans to the ryots at the rate not exceeding Rs. 2,500 for the purchase of pumping machinery for the filter points sunk successfully in the party's lands. The loan will be given in the shape of pumping machinery. The loan given to ryots will be recovered in 5 annual instalments with 5½ per cent interest. Among the chief reasons for the success of this extended filter point tube well schemes was the intensive work done in the districts and the cash loan amount of Rs. 2,500 sanctioned for each successful tapping for purchasing the required oil engine and pump combination for installing at each of these places.

The number of points sunk successfully and number of loans sanctioned to ryots up to 30th June 1953 in the following districts are shown below :—

District.	Target.	Number successfully sunk.	Number of loans sanctioned to ryots.
(2)	(2)	(3)	(4)
West Godavari	50	87	59
East Godavari	90	95	95
Nellore	55	57	57
Guntur	70	107	107
Chingleput	40	40	12
North Arcot	45	51	45
South Arcot	45	48	20
Tanjore	75	80	64
Pattukkottai	25	24	24
Tiruchirappalli	50	73	54
Madurai	25	33	24
Ramanathapuram	30	30	22
Total	600	725	583

Government have been addressed for the extension of time up to 30th September 1953 for granting of loans and fitting in of pumpsets to filter points sunk. The remaining loans will be sanctioned to the ryots and it is expected to complete the entire work of the scheme before 30th September 1953. The filter points have been very useful to the ryots.

Boring set.—Two departmental small power boring sets purchased from Messrs Equipment Company, Coimbatore, are now working at the Agricultural Research Station, Pattukottai and Agricultural Research Station, Koilpatti.

Orders have been issued by Government that 75 per cent of the hand boring sets and power drills of the Industries department should be

exclusively earmarked for agricultural purposes and should be allotted on priority basis on the recommendation of the District Agricultural Officers concerned. This arrangement is expected to meet the needs of the cultivators in a more ready manner.

River pumping scheme.—The importance of this scheme lies in its far-reaching benefits to a group of ryots in a whole village and to the State as well in the matter of increased food production and to effect on a village basis improvements to the rural economy. This scheme was originally drawn up with the idea of giving some subsidy to the ryots concerned for encouraging rice production. In June 1952 Government decided that there-after river pumping scheme should be worked only through co-operative societies and that new scheme should be started only if the Registrar of Co-operative Societies was able to form co-operative societies to run them. It was also ordered that, in the case of scheme already sanctioned if the Registrar of Co-operative Societies was not able to form any co-operative societies, they might be continued to be run by the Agricultural department provided the beneficiaries agreed to meet the entire cost of the scheme. Till the end of November 1952, the Registrar of Co-operative Societies was not able to form any co-operative society and reported to Government that the river pumping project could not be straightaway worked as a business proposition and that unless the concession and subsidies originally sanctioned by Government are granted, the beneficiaries would not readily form into a co-operative society, either for taking up the old schemes already sanctioned or for running of the new schemes proposed and pending sanction of Government. Therefore in January 1953, Government ordered that the river pumping schemes in respect of which the Registrar of Co-operative Societies is not able to form any co-operative society may be run by this department on a "no loss no profit" basis.

In the Intensive Cultivation programme for 1953-54, it was proposed to complete 50 river pumping schemes in G.O. Ms. No. 128, Food and Agriculture (Food Production), dated 30th March 1953, Government sanctioned the appointment of an Assistant Agricultural Engineer exclusively for the river pumping schemes and also the retention of the following special staff till 31st March 1954 :—

- One Assistant Agricultural Engineer.
- One Agricultural Engineering Supervisor.
- One draughtsman.
- One upper division clerk.
- One lower division clerk.

Proposals recommending the appointment of an Assistant Agricultural Engineer for this scheme are under consideration of the Government. The posts of upper division clerk and the draughtsman are also kept in abeyance pending appointment of the Assistant Agricultural Engineer.

Several memoranda have been received from the ryots of various districts for the early starting of the river pumping schemes for which inspection, investigation and the survey as well as the preparation of the detailed plans, estimates, etc., have to be attended to. As soon as the Assistant Agricultural Engineer is appointed, a systematic attempt will be made to bring into existence as many river pumping schemes as could be formed by concentrating on these items of work and also by intensive propaganda and publicity about this scheme so that the advantages of using river waters on a collective basis may be fully brought home to them. Although the District Agricultural Officers originally reported the demand and

possibility of starting these schemes in a number of places in the districts, they have to be re-examined again with reference to the revised decision of Government to find out whether the beneficiaries are prepared to take up the scheme on a "No loss—No Profit" basis and also the existing rights from such sources.

Details of the places, areas irrigated and the anticipated additional food production in respect of the river pumping schemes that were in operation during the period under report are furnished below :—

Number and place where the scheme is in operation.	Area benefited in the scheme during the year 1952-53.	Anticipated additional food production.
(1)	(2)	(3)
	ACS.	
1 Pinayur (Chingleput district) ..	180	90 tons.
2 Nelvoy Do. ..	200	100 tons.
3 Mathur (South Kanara district).	110.42	113.30 tons.
4 Sajipa Nadu (South Kanara district).	41	26.67 tons.
5 Karimbedu (Chittoor district) ..	111.17	1,632 bags of 160 lb. (total production).

The beneficiaries of the river pumping schemes at Pinayur and Nelvoy in Chingleput district have expressed their desire to have these schemes on a permanent basis as they are able to cultivate their fields successively all round the year only on account of this scheme and there are no other alternative sources of irrigation for these schemes their lands would have to remain fallow due to the failure of seasonal rains and lack of any other irrigation facilities.

The river pumping schemes at Mathur in South Kanara district is also working satisfactorily. The District Agricultural Officer, Mangalore, has been instructed to collect the water charges in full due in respect of the crops harvested so far in accordance with the new rules to be applied in this regard. The river pumping scheme at Sajipa Nadu was taken up by the District Agricultural Officer, Mangalore, in place of the one sanctioned for Charvakka as the ryots of the latter village were not agreeable to meet the entire expenditure of the scheme under the no loss no profit plan. Though about 80 acres are available for irrigation under this scheme only 41 acres were taken up initially for the present crop as the scheme was started somewhat late to catch the 3rd crop season.

The river pumping scheme at Karimbedu village in Chittoor district had to be discontinued as the beneficiaries were not keen on the continuance of the scheme after the recent rains and the re-commencement of the natural flow in the adjoining river spring channel. The scheme sanctioned for Arcot Kuppam village in Chittoor district had to be dropped as the ryots were not willing to bear the entire all in cost of the scheme as per revised rules.

The District Agricultural Officer, Shoranur, has been instructed to take up the two River pumping schemes sanctioned for Malabar district—if the ryots are willing to bear the entire cost of the scheme including depreciation and interest on capital cost and this is still under negotiation with the beneficiaries in the respective areas.

A new pumping unit at Kizhavur in Tanjore district is also being started and has been successfully completed at the time of writing this report.

Pipes.—This department continued to acquire pipes for meeting the demands on quarterly allotments recommended by the Ministry of Agriculture, New Delhi, to the Iron and Steel Controller, Calcutta, since 1949. The pipes thus acquired were distributed to the ryots without loss to Government as envisaged in the G.O. No. 73, Food and Agriculture, on a "No loss and no profit" basis from the various district headquarters depots for pumping and other agricultural needs.

The procurement and delivery of pipes during the period under report has shown appreciable improvement from the middle of fasli year 1952-53 when compared to the supplies of the previous years. In the year 1951-52, when the supply of pipes was acute with a large accumulation of unsupplied demands the Government in G.O. Ms. No. 68, Food and Agriculture (Food Production), dated 19th February 1952, sanctioned the acquisition of 435 tons of G.I. pipes from out of the direct imports of Messrs. Kalinga Tubes, Limited, Madras. Thus a total quantity of 702,877 feet of G.I. pipes comprising 1½ inches to 4 inches sizes were acquired in the department in 1952-53 as an ad hoc allotment to the Madras State to meet the accumulated unsupplied demands of the different districts for agricultural users.

A total quantity of 96,211 feet of pipes from the whole stock held in the depots was distributed as per Appendix No. (II) to the agriculturists by this department in the fasli year 1952-53, whereas in the fasli 1951-52 a total quantity of 256,138 feet of pipes was sold to the agriculturists. The slow progress on the sale of pipes is due to the fact that the Government of India suddenly in the middle of 1952 permitted the stock holders to directly sell 50 per cent of their stock for free trade and without permit. But in January 1953 the Government of India decontrolled the pipes fully and again this sudden full decontrol resulted in a glut in the market and slump in the local price as a result of the large import permitted from foreign producers.

The quarterly indents for pipes were then stopped and no pipes were purchased on permits from the third quarter 1952 onwards against the usual allocations made by the Iron and Steel Controller. The sale of pipes by the department began to gradually diminish as a result of the total decontrol and the large quantities available in the open market caused by the subsequent cheaper and lighter quality materials. The prices of the pipes in the market also went down during the year to an appreciable extent. Hence this department immediately sent proposals for consideration of Government (i) to relax all rules imposed on the supply of pipes for the agricultural purposes, (ii) to sell the pipes freely to all, either for the agriculturists or others at any quantity, (iii) to enjoin all the Government departments to take their requirements of pipes for their uses from the stock held in the depots of the Agricultural Department and (iv) to request the co-operative societies and other quasi-Government department to take their full requirements of pipes required for their uses.

The Government were also intimated in detail of the position of pipes in the State and hence in G.O. No. 302, Food and Agriculture (Food Production), dated 23rd July 1953, passed orders that all the rules imposed on the supply of pipes be removed and sell the pipes freely to all at the prevailing market rates minimising the loss to Government. The Government also informed all other Government departments and quasi-Government department to take their fullest requirements of pipes from the Agricultural departmental depots and to regularize the transaction of accounts as

envisaged in the Government Memorandum No. 96761 (P.W.R.), Finance, dated 5th January 1953.

The Government in the conclusion of the G.O. No. 302, Food and Agriculture (Food Production), dated 23rd July 1953, also called for monthly progress report on the sale of pipes till the stocks held in the department are exhausted completely and proposals for writing off the loss to Government when the pipes are sold at the prevailing market rates.

The subordinate officers have all been addressed to sell the pipes freely to all and submit proposals for writing off the losses by Government. The first monthly progress report on the sale of pipes held in the department is expected to be sent to Government by 15th September 1953.

M.B. sheds.—The erection of all the 46 M.B. sheds sanctioned in G.O. No. 2445, Development, dated 22nd May 1946, for proper storage accommodation for seeds, manures and other agricultural implements at the various selected district centres have been completed and they are all in regular use for storage and other purposes. Proposals have already been formulated for electrifying certain M.B. sheds so as to provide some minor workshop facilities for the departmental machinery at such centres, and render greater service to agriculturists. The electrification for the M.B. sheds at some centres is being carried on by the Electricity department. The M.B. shed at Bellary has been converted as a regular workshop for the maintenance and repairs to tractors and other agricultural machinery—for serving the Ceded districts in general and the Tungabhadra areas where a large scale reclamation of lands was proposed for conversion of the dry lands into wet fields.

Lorries.—Forty lorries were acquired from the Thompson Disposals during April 1946 as per G.O. Ms. No. 1538, Development, dated 15th April 1946, and two more new lorries were also purchased from Messrs. Sundaram Motors, Limited, Madras-2—through the State Transport Commissioner during March 1952 to replace the two old condemned vehicles as those were declared uneconomical for repairs. The two vehicles, i.e., lorry MDV. 1103 and station wagon MDV. 1420 were condemned as per the Government orders, as these broke down frequently and became very heavy on repairs and renewals. Action has also been taken to have a lorry in the place of the condemned lorry MDV. 1103. The other lorries which have given fairly satisfactory service so far are now going into repairs more often than before and some are also in need of major repairs. Lorry MDB. 1464 has been transferred from Tungabhadra Project dam site to the Superintendent, Agricultural Research Station, Siruguppa, as per G.O. Ms. No. 1594, Public Works, dated 9th April 1953.

Number of lorries	41
Number of buses	6
Number of station wagons	3
	—
Total number of vehicles	50
	—

Jeeps.—Thirty jeeps were originally acquired from the Thompson Disposals during 1946 as per the G.O. Ms. No. 1538, Development, dated 15th April 1946. In addition to the original strength of 30 jeeps new jeeps were purchased during the previous years for the use of a few select out-of-the-way agricultural stations and the tractor workshops at Bapatla and Coimbatore. Jeeps have become available in the market through the

Transport Commissioner and consequently one each for Fruit Research Station, Kodur, Agricultural Research Stations, Guntur and Nanjanad, Assistant Agricultural Engineer, Tube Well Scheme, Mayuram, and the District Agricultural Officer, Tellicherry, have been supplied. Three trailers have been purchased and distributed one each for the Assistant Agricultural Engineer, Tube Wells Scheme, Mayuram, the Assistant Agricultural Engineer, Soil Conservation Scheme, Bellary, and Central Agricultural Engineering Stores, Madras. Further the Government in G.O. Ms. No. 964, Food and Agriculture, dated 19th June 1953, have sanctioned two more trailers which have been purchased and sent one each for the Assistant Agricultural Engineer (Inspection), Bellary, and the Assistant Agricultural Engineer, Tractor Workshop, Coimbatore. The Government in G.O. Ms. No. 869, Food and Agriculture, dated 5th June 1953, have recently sanctioned the transfer of six old used jeeps from the surplus stocks of the civil supplies units for the use of the department. These six jeeps have been allotted one for each of the Assistant Engineer (Inspection), Anakapalle, Vizianagaram, Vellore, Tiruchirappalli, Bellary, and Assistant Agricultural Engineer, Tractor Workshop, Bellary. The total number of jeeps and land rovers held by the department is 47 at present.

Iron and steel.—The scheme for the distribution of iron and steel to agriculturists was introduced as one of the activities of the department in the third quarter of 1944, in furtherance of the Grow More Food Campaign and as a part of the Government plan to make available to the ryots their requirements of iron and steel at fair prices and on a broad based distribution set up.

The work connected with the distribution of fabricated agricultural implements was transferred to the co-operative societies in G.O. No. 6250, Development, dated 17th December 1948. The co-operative societies entrusted with this work were directed by Government to take over all the stocks of agricultural implements held in the depots of the Agricultural Department, for sale to ryots. The response of the co-operative societies was very unsatisfactory and hence this department continued the sale of implements held in stock. In view of the transfer of this work to the co-operative societies further acquisition of fabricated agricultural implements by the department was stopped and the fabricators were directed to effect distribution of the fabricated implements through co-operative societies in their respective district.

The work relating to the distribution of raw materials for agricultural purposes like G.C. sheets for cattle sheds, cart tyres, barbed wire, etc., still remained with the Agricultural Department. This work was also transferred to the co-operative societies by Government in G.O. No. 34, Food and Agriculture (Food Production), dated 4th July 1950. In view of the transfer of this work to the co-operative societies, acquisition of raw materials by the department was also stopped. But the work relating to the planning for supply of iron and steel for agricultural purposes is still done by this department in consultation with the Registrar of Co-operative Societies and the trade interests.

Government ordered the transfer of the work relating to the issue of permits for agricultural purposes to this department from the office of the Director of Controlled Commodities, Madras, with effect from 1st August 1952. To shoulder the heavy item of extra work, proposals were submitted to Government for according sanction for the employment of a small additional staff. As Government did not agree to incur extra expenditure on this account they ordered the retransfer of this work back to the Director of

Controlled Commodities, Madras, in G.O. Ms. No. 9, Food and Agriculture (Food Production), dated 6th January 1953.

The details of allotment of iron and steel made for agricultural purposes for 1951-52 and 1952-53 are as under :—

	1951-52.	1952-53.
	TONS.	TONS.
Standard steel	22,530	17,630
Non-standard steel	4,060	4,200

Considerable accumulation of stocks were reported by the registered dealers partly on account of the failure of the co-operative societies to promptly lift the allotments made to them and in a certain measure by the financial slump and economic depression. The co-operative societies in their turn complained of lack of adequate demand from ryots. The successive failure of monsoon and the famine and severe distress conditions all round reduced the demand from ryots. Added to this the rush supplies made to the stockists by the producers after the sanction of the price increase contributed to the accumulation of the stocks with the dealers. To give relief to the stockists, the Iron and Steel Controller, Calcutta, granted general permission in September 1952 to dispose of stocks over sixty days old and not covered by pending permits.

In January 1953, the Iron and Steel Controller relaxed distribution control over light structurals, bars and rods with reference to the stocks handled by the registered stockists. Distribution control over heavy sections of structurals was lifted some time earlier and by this certain types of iron and steel became decontrolled.

Even though the co-operative societies were specifically directed by the Government to take over the stocks of agricultural implements and raw materials from the agricultural depots at the time of transfer of the connected work to the co-operative societies the response of the societies was unsatisfactory with the result that the department had to continue the sale of these stocks and clear them. In G.O. No. 101, Food and Agriculture (Food Production), dated 15th March 1951, Government permitted the disposal of these stocks at current market rates. Subsequently Government permitted the disposal of the slow moving and unwanted materials at some reduced rates in G.O. No. 560, Food and Agriculture (Food Production), dated 18th December 1951. Finally Government have accorded sanction for the disposal of the slow moving and unwanted stocks still remaining with the department in public auction in G.O. Ms. No. 482, Food and Agriculture (Food Production), dated 29th December 1952, and the stocks are being liquidated in all the districts.

Implements and machinery.—In addition to supplying agriculturists implements and machines, investigation on the suitability of agricultural machinery designed in other countries were carried out. The following are some of the machinery under experimentation and research :—

- (1) Daine threshing machine.
- (2) Groundnut picker and recleaner.
- (3) Messay Harris self-propelled harvester combine.
- (4) Danish hay press.
- (5) Royer compost shredder mixer.
- (6) Kernels automatic oscillator sprayer.
- (7) Bullock mower.
- (8) CB 45 grooming equipment.

A brief note on each of the above machine is appended at the end of this chapter.

The work of improving the indigenous agricultural implements and designing new ones in the light of modern development in agricultural machinery to suit the conditions of the State is a very important item. Bearing this in mind the Assistant Agricultural Engineer (Research) has been directed to conduct more research and prepare three-year programme through the Research Council.

In December 1950, the Indian Central Oilseeds Committee informed Government that it contemplated to start two schemes one in respect of manually operated and bullock-driven machinery and the other in respect of tractor-driven machinery with a view to evolve suitable machinery for the cultivation and harvesting of groundnuts in India. The Committee proposed to work the scheme in respect of the manually operated and bullock-driven machinery for a period of five years at Coimbatore and the scheme for the tractor-driven machinery for a period of three years at Tindivanam in this State. Government have agreed to work the two schemes as proposed by the Committee. The Assistant Agricultural Engineer for the schemes has been appointed recently.

A Conference of Agricultural Engineers presided over by the Union Minister for Agriculture was held on 8th and 9th January 1953 at New Delhi wherein problems relating to the Agricultural Engineering were discussed and several recommendations were made. Steps have been taken to implement these recommendations.

As a result of the discussions during the Conference of Agricultural Engineers, it is proposed to conduct a survey of all types of indigenous agricultural implements on an All-India basis. The Indian Council of Agricultural Research called for details of financial implications which have been furnished and the final approval of the Indian Council of Agricultural Research is awaited.

It was also proposed to appoint an Advisory Committee consisting of representatives of cultivators, makers of agricultural implements, the co-operative organizations and departmental officers on the research and propaganda sides to gather together at a common centre periodically and arrive at agreed formulae regarding requirements of cultivators in respect of agricultural implements and to bring to notice of the manufacturing firms the implements to be manufactured. This Committee is also to arrange for tests of improved agricultural implements in conjunction with the Agricultural Department wherever suitable implements have been manufactured and tested by the manufacturers and after the confirmation of the usefulness of new improved implements to forward them with a report to the Central Testing Station for final testing. Orders of Government are awaited.

A third proposal was to get agricultural implements on consignment basis from organized manufacturers and supply them to ryots through multi-purpose co-operative societies. The matter is under consideration of Government.

Another proposal was to draw up two schemes for intensive demonstration, one for the general district level to be carried out by the Agricultural Demonstrators under the District Agricultural Officers and the second on a slightly elaborate scale in consultation with the Project Executive Officers in Community Project centres. Final orders of Government for drawing up the schemes are awaited.

A fifth proposal was to give training to blacksmiths and craftsmen for undertaking manufacture of and repairs to improved agricultural implements. A scheme has been submitted to Government as per instructions of the Government on the request of the Indian Council of Agricultural Research.

It is also proposed to purchase rotary harrows, rotary cultivators and screw type power tillers from Japan, conduct trials and examine their utility. Government have called for the financial implications. The firms in Japan have been addressed for particulars pertaining to cost, etc.

The Japanese method of rice cultivation is being given wide publicity. The implements required for adopting the Japanese method are being designed and tried at the Research Engineering Workshops at Coimbatore.

The new type of rotary paddy inter-cultivator designed after the Japanese original, has been sent out for trials at some of the agricultural research stations and the preliminary reports received from them contain encouraging reports about their performance. These rotary inter-cultivators are intended for manual operation in puddles planted in rows. It has been taken up with special enthusiasm by ryots in the districts of Krishna and West Godavari and the local fabricators have also begun to produce them at cheap prices.

Another small agricultural machine of importance to the paddy grower made during the year and tested is the Japanese type paddy treadle threshing machine which is said to be very popular among the ryots in that country. Preliminary trials with this one man treadle thresher proved very satisfactory and to increase the output a two-man pedal thresher is under construction. Since these units are easily portable and require no skill in operation they are likely to prove popular in the paddy areas of this State. This machine adopts entirely a new principle different from what is done in the western countries threshers. The earheads are made to pass on top of the rotating drum with short spikes unlike the traditional western machines where the stalks are required to go through the space at the bottom of the peg drum and the fixed concave. After further trials this has to lead to the natural development of the threshing, winnowing and automatic combine worked with a small powered engine or electric motor. This type of automatic combine has already made considerable headway among the paddy growers in Japan and possesses great potentialities for use in the paddy producing areas in this State which have to face a wet harvest in particular. The low priced units should be particularly attractive to the small growers.

APPENDIX.

A BRIEF NOTE ON AGRICULTURAL MACHINERY.

1. *Dania threshing machine*.—The Dania weight separator or the threshing machine is capable of automatic threshing and winnowing. The demonstration of this machine has given complete satisfaction. It has a capacity of nearly 1,900—2,000 lb. of cleaned and bagged grain per hour in respect of paddy. There is no loss of grain during the threshing operations and the breakages of the grain are found to be less than $\frac{1}{2}$ per cent. The straw as it comes out of the machine after threshing is soft and palatable. It does not need any further treading with animals as in the case of hand threshed sheaves. The unique feature about this machine is that the different operations of threshing, winnowing, cleaning and bagging are all simultaneously carried out in the proper sequence and the grain is automatically filled in the gunnies attached to the grain spout.

2. *Groundnut picker and recleaner*.—This machine is used for separating the pods from the vines and soil. The pods are delivered thoroughly cleaned into sacks without loss of picked nuts. The operation of the machine is very simple and is well within the comprehension of workers having only elementary knowledge of machinery. The results of trials with this machine at the Agricultural Research Station, Tindivanam are highly satisfactory.

3. *Massey Harris self-propelled harvester combine*.—This machine purchased from Messrs. Construction Equipment Company, Bombay, was tried on various crops. The machine is designed to pick up lodged plants, separate the earheads from the straw, clean and bag all in one complete unit. Experiments conducted on crops of bengalgram, cumbu, cholam, and tenai are satisfactory. Experiments on paddy will be taken up during the next season.

4. *Hay press*.—Straw has to be pressed and baled for exporting or stacking. The mechanically operated straw baling press presses the straw and ties them in bales and releases for being transported easily.

5. *Royer compost shredder mixer*.—One small demonstration unit of the compost shredder mixer was purchased from Messrs. Royer Foundry and Machine Co., Cincinnati, United States of America. This can be operated by an electric motor or tractor belt power. Waste materials and trash discharge at bottom by lifting retaining gate. Experiments conducted at Coimbatore showed that the optimum condition for working the machine are moist compost at a speed of 1,000 R.P.M. The turnover at this speed was $2\frac{1}{2}$ tons of compost in one hour. If the shredder is mounted at the rear of a trailer drawn by a tractor, the shredded manure is projected to a distance of 6 feet to 8 feet and uniform spreading is obtained.

6. *Kennels automatic oscillator sprayer*.—The equipment consists of 15 lengths of $1\frac{1}{2}$ " diameter pipes of light weight aluminium alloy, each 12 feet long making a total of 180 feet. These pipes mounted on portable iron stands and pipes can be moved and placed in any desired position. Small holes of about $\frac{1}{64}$ " diameter are drilled into the pipes at 2 feet intervals in a line on the top of the pipe. These are provided with nipples to guide the water radially upwards. One end of the line is blocked. The other end is connected to an oscillator head consisting of a Damper in which the piston is fitted. Two openings are provided one at each side. Water is forced out through the nozzles to a distance of 25 feet on either side. This can be used for spraying manures and insecticides also.

A series of experiments were conducted at Bapatla with this sprayer to ascertain the possibility of applying this method of over head irrigation on a large scale for agricultural purposes. For sandy areas which do not permit the usual flow irrigation methods this method of rainier irrigation has a future and can be applied with saving in water and costs also. This overhead irrigation is suited for orchards and sloping terrain. The experiments are being continued at Bapatla.

7. *Bullock drawn mower*.—One Bullock Mower was purchased from Messrs. Volkart Bros., Ltd., Madras, with intention of evolving suitable models with slight modifications for cutting and gathering grass on west coast. Experiments were conducted on a crop of cholam. Further trials are proposed to be conducted during the next season.

8. *C. B. 45 Grooming equipment*.—An item of special interest to livestock owners is the new electric grooming equipment that was obtained from the United Kingdom. The equipment comprises an electric motor on a swivel based, a flexible driving shaft and a hand piece carrying remote switch control. The rotary brushes or the stripper could be attached to the hand piece.

It was first tried with the cows in the College Dairy and also with some of the farm animals. Although on the first attempt the animals were shy and felt nervous, they soon became used to this new grooming and brushing appliance and displayed great liking to this cleaning of the coat. After a few days of regular grooming and brushing there was noticeable improvement of the coat and the animals also looked better. In the old days manual and muscular grooming was a regular feature in the maintenance of animals and this fact is disappearing now. This new electric grooming appliance is thus of a great value in the proper cleaning, brushing and grooming of cows and bullocks in particular and is of special advantage to dairies as also for individual owners keenly interested in the welfare of their livestock.

TRACTORS AND LAND RECLAMATION.

Reclamation of cultivable waste lands and mechanical cultivation methods have begun to be increasingly recognized as an important way of extending agricultural production. Extensive and intensive cultivation practices with the help of mechanical cultivation equipment like tractors and bulldozers and other auxillary equipment are some of the important items planned under the accelerated food production policy for achieving self-sufficiency as early as possible and also to raise the average level of returns from the land on a stabilised basis.

Departmental tractors are used for ploughing and harrowing and also for puddling and green manure trampling in wet lands with the rotavator attachment. Bulldozers are now regularly employed for reclamation of waste lands and clearance of new areas involving levelling, bunding and cultivating realigning eroded fields, filling up gullies, clearance of sand cast areas in flood damaged places, excavation of tanks, silt removal in tanks and spring channels, etc. In fact the beneficial and efficient uses for which these modern machinery can be put to combining saving in time, and money are varied and very many. They are steadily becoming more and more useful in day-to-day agriculture. As reclamation operations, heavy earth moving and preliminary cultural operations, etc., involve a lot of expenditure and time, if carried out with the usual animal or manual power, these operations are now required by cultivators to be performed with efficiency, timeliness and saving in costs with the help of these modern machinery now hired out by the Agricultural Engineering Branch.

For extending the areas, suitable for cultivation in connexion with the accelerated food production policy further intensification of efforts to afford mechanical cultivation aids and machinery on hire basis to cultivators and land owners to reclaim areas and old and abandoned fallows has been effected.

New tractors were added during the year to the fleet already in the department and the total number increased from 292 to 302 with standing and proved makes and types only as approved by the Agricultural Machinery Advisory Committee. Departmental tractors are now in operation in all the districts of this State as shown in Appendix 1.

The special feature of the year is the popular demand for bulldozers for levelling and contour ploughing in the Nilgiris. There are stated to be nearly 653 tractors in this State as against 624 during the last year as detailed below:—

Government Agricultural Department	.. ..	302
Other than Agricultural Department	.. ..	62
Private parties .. ..	.. ..	264
Co-operative societies .. ..	.. ..	25
Total .. ..	.. ..	653

There is also an increasing number of agriculturists buying their own tractors and employing them on a wider basis on their own lands.

A statement showing the acreage tackled by the departmental tractors from the period commencing from 1946-47 to 1952-53 is furnished in the Appendix.

In assessing figures in respect of additional production relating to reclamation of virgin lands by means of tractors additional production is estimated at an average rate of $\frac{1}{4}$ ton per acre and for the current fallows at $\frac{1}{40}$ ton per acre. Out of the total outturn of 52,291 acres 22,166 acres have been newly reclaimed from virgin areas and the rest are old abandoned fallows that had remained uncultivated for several seasons. This shows that there is a small increase over the corresponding total of the previous year. In this connexion the failure of the seasonal monsoons and the acute drought conditions that prevailed in many of the districts had a retarding effect on the completion of the targets framed under this item. Near famine and acute shortage of even drinking water was so bad that some of the small tractors with tanker trailers were put to transport of drinking water. Although the demand for ploughing fell down considerably in these years' figures. With the improved crop conditions this season, the outturn is expected to be further bettered next year.

It may be seen from the above that there has been a progressive development in the turnover by the bulldozers which are worked for the preliminary clearance, levelling, bunding and reclamation of waste lands and abandoned areas. Bulldozers have also been employed with considerable saving in expenditure and speed in clearance of cyclone damaged and flood-affected sand cast areas in the districts of Srikakulam, East Godavari, Nellore, Coimbatore, West Godavari, Anantapur, Chittoor and Chingleput. Total number of hours worked by the bulldozers has shown an increase of over 7,500 over the totals for the previous year. The demand for bulldozers has been steady in all the districts and in some districts this has been very much heavier than in the previous years and many applications still remain uncomplished with. It is all the more remarkable because all the hire charges due for the loaning of these machines are now collected in advance and in full and this is found to be a great hardship to the ryots who do not have ready fluid cash resources at all times.

On account of the continued drought conditions and lack of sufficient moisture in the soil, appreciable outturn could not be shown. The ryots have not the same means to pay in cash in advance for taking the tractors and bulldozers on hire from the department, which is now strictly enforced. If the system of granting special loans to enable the ryots to pay the hire charges in advance as required by the rules is sanctioned, it is expected to achieve more outturn. The district officers and the Assistant Agricultural Engineers have frequently stated that the demand and outturn could be more than doubled if such loan facilities are available to ryots in the various districts.

In the same way as the progressive increase year by year in the outturn of the tractors, the receipts to the department by way of hire charges for the tractors and bulldozers have also increased. Particulars of total hire charges during the last seven years are tabulated hereunder :—

	RS.
1946-47	83,710
1947-48	1,25,651
1948-49	3,13,788
1949-50	5,93,431
1950-51	11,56,628
1951-52	16,88,752
1952-53	19,51,765

A constant watch is maintained on the progressive receipts to ensure that the service is taken on a no profit no loss basis to the State and ultimately given an adequate outturn on the out lay. As already stated the receipts could be doubled if easy credit facilities are provided for the Land Reclamation Scheme.

XXI. FIVE-YEAR PLAN.

The programme for land reclamation by mechanised means for the next three years is furnished below on the assumption that credit facilities now under consideration will be made on a short or medium term basis.

Year.	Number of additional units proposed to be purchased.	Target in acres.
1953-54	25	1,00,000
1954-55	35	1,10,000
1955-56	35	1,20,000

There has been a progressive increase in the rate of hire charges on departmental tractors and bull dozer's as shown in Appendix No. 3. There is also a separate proposal to enhance the rates on hire charges on tractors and bull dozers so that the expenditure including interest and capital outlay on the machinery may become fully recoverable from these hire charges.

The question of hiring the departmental tractor and bull dozers to agriculturists for land reclamation work in aid of the Grow More Food campaign and collecting the hire charges under Takkavi loan on three equal annual instalments instead of collecting in cash in advance and in full is still pending orders of Government. There are large areas available for reclamation in all the districts but those owners do not have the finance to put them under the plough.

As a result of continuous failure of seasonal conditions over the last six years and the consequent inability of ryots in the dry areas of many districts the normal agricultural operations have been given a severe set back. In such scarcity areas on account of the already poor repaying capacity of ryots, further going down considerably, their capacity for fresh borrowings is stated to have correspondingly dwindled. This had led to the usual money lending agencies in the villages resorting to National Savings investments and also the State Loans floated at better interest rates than during the previous years. Agriculturists have therefore begun to request Government to grant Takkavi loans on a liberal basis and also provide adequate funds to the several districts for loan disbursements to meet the situation. On account of the tightening of the credit facilities by the banks in the urban areas as an anti-inflationary measure, rural credit has suffered further shrinkage and affected the ryots in a greater measure than ever before. The payment and collection of hire charges in full advance and in cash has been found to be very difficult and caused delays in the actual field operations on the party's lands. Government have been separately addressed about the need to make adequate provisions under the Takkavi loan amounts allotted to the various districts, and to enable the District Agricultural Officers to sanction loans to ryots for meeting the tractor and bull dozer hire charges. The District Collectors of the badly drought affected districts have also recommended the grant of such ready loan facilities to meet tractor and bull dozer hire charges demand for their use.

Demonstration.—Extended demonstration of the David Brown Tractor and rotavator was conducted under varying conditions in Tanjore district in

August 1952 for puddling operations. The demonstrations were held successfully in the presence of a large gathering of leading mirasdars and high officials.

The David Brown tractor and rotavator was also demonstrated to the delegates and Departmental Officers who attended the College Day Conference on 14th August 1952 and to the trainees of the Food and Agricultural Organization on 15th August 1952 at the C. Block field in the wet lands of the Central Farm, Coimbatore. The puddling was effective and was to a depth of 7 to 9 inches. A single puddling operation is enough to produce the proper puddle. If green manure is to be incorporated into the soil the rotavator can be worked with the standing crops of green manure in the field or the green manure crop can be spread over the field before working the rotavator. The rotavator works much better than the modified trailed puddler which was previously tried for wet land operations. Unlike the puddler where it gets its rotary motion due to the pull of the tractor, the tractor gets its rotary motion from the power of take off. This ensures better stirring of the soil and avoids all slippage losses.

The John Deere Groundnut planter picker and harvester equipment was tried for sowing groundnut in Tindivanam. The trial was not economical for sowing groundnut due to the difficulty in obtaining closer spacing between 6 to 9 inches according to local practices. With some alterations, the existing minimum spacing of 27 inches with this implement could be reduced to 1 foot 3 inches. This equipment may prove effective for crops with wider spacing like castor.

The John Deere Groundnut planter picker and harvester equipment was tried again at Agricultural Research Station, Tindivanam after effecting fresh adjustments to the drilling mechanism in July 1952, by which the old defect of crushing of seeds could be eliminated. With this implement it is not possible to obtain the close spacing and seed rate which will suit the local conditions. Considering these difficulties and draw backs, with this implement and the fact that a better and cheaper implement has been evolved at the workshops of the Assistant Agricultural Engineer (Research), Coimbatore for the purpose of sowing of groundnut it can be concluded that the John Deere Planter attachment is not suitable in the form in which it is used abroad for conditions prevailing in this State.

"John Deere Peanut Harvester was tried after carrying out further improvements at the Agricultural Research Station, Tindivanam in February 1953, with a newly designed composite attachment including three numbers of three feet Guntaka blades with a wide curve fitted with hydraulic linkage at the rear of the John Deere tractor and a side delivery rake as a trailed implement. This combination worked very satisfactorily and is an improvement over the original attachment of the harvester. As the Guntaka is drawn along the soil is loosened to a depth of 4 inches and simultaneously the side delivery rake collects the vines and heaps them along in a row at one end. The clods of earth are broken well by this rake fingers. The action of the rake fingers also exposes a good percentage of the buried pods and leaves them visible on the surface for easy picking with appreciable saving in time and labour. Groundnut harvesting operations if done manually cost the cultivator as much as Rs. 40 to Rs. 50 per acre. By the use of these implements with tractor the cost could be reduced to as low as Rs. 15-8-0 and the cost will be still less in bunch variety of crops where the working is still better.

It may be seen from the above that the John Deere Peanut Planter in its original form is not altogether suitable for Indian conditions though the John Deere Harvester can work satisfactorily after addition of weights and attachments of rear blade. Further trials on a large scale with the newly modified John Deere Harvester will be made in due course during the next season.

During the Madras State Ryots' Conference held at Manjur at Chingleput on 2nd November 1952, a tractor ploughing and levelling demonstration was arranged in the presence of a large number of people including the delegates and the Minister for Agriculture.

In their Order Ms. No. 352, Food and Agriculture (Food Production) Government have permitted the Joint Director of Agriculture (Engineering) to attend the conference at New Delhi on 6th October 1952 in connexion with the review of the policy regarding the import of tractors and their after sales servicing arrangements. The Joint Director of Agriculture (Engineering) attended the conference. The Minister for Agriculture, Government of India, opened the proceedings. It has been decided at that meeting that—

(a) The existing ban on import of tractors of less than 15 h.p. at the drawbar and those operating on petrol should continue. Government at their discretion may however, permit import of tractors of less than 15 h.p. in special case provided they are not two wheeled garden tractors and using petrol as fuel.

(b) Policy regarding the import of rotary hoes, rotary and rototiller should be brought in line with the import policy regarding tractors.

(c) An Expert Committee consisting of representatives of Government importers and farmers may be appointed to examine in detail the question of minimum stocks of spare parts which the dealers should be required to stock to keep the price structure of the various kinds of spares, the standard of after sales service and the standard charges for such services. The Committee will also examine the question of importers and the possibility of starting the manufacture of tractor spare parts in India.

Experiments—Tractor ploughing and the plantations.—To ascertain the possibility of using tractors for deep tillage in respect of demands other than agricultural an experimental fuel tree planting plot was taken up in the Forest College Estate covering nearly five acres. This was deep ploughed to nearly 14 inches and by its side another similar area was given the customary ploughing with the ordinary bullock plough. At the end of the first two years the average height of the trees in the deep ploughed plot stood between 6 and 7 feet whereas the shallow ploughed plot the average growth was only 2 to 3 feet. This indicates a clear possibility of using the departmental ploughing outfits to help the fuel plantations in co-operation with the Forest Department as this will contribute substantially to the speedier growth of trees in the deep ploughed areas. It is understood that a private commercial concern interested in planting its own timber for plywood manufacture has taken up large scale deep contour ploughing with trenching on a similar basis and has obtained almost similar spectacular growth during the first year as in the case of the Forest College. The Principal of the Forest College has reported that in our dry area to be regenerated by fuel species, deep ploughing not only turns over the soil and breaks up its capillarity but also removes the matty root system of the grass present thus enabling the roots of the plants to penetrate easily, and result in early establishment. He has also stated that all the areas in the

College Estate are now being invariably ploughed by the tractor before sowing and planting by the students. It is also stated that the areas similarly tackled by the Mysore Forest Department are giving excellent results.

A pilot scheme for small scale contour ploughing in certain selected areas in the Wenlock Downs in the Nilgiris district is proposed to be taken up shortly for extending wattle plantations. The deep ploughed areas afford easier penetration of the tree roots to the sub-soil zone and greater moisture for pushing up rapid growth. Both on account of contour ploughing and contour trenching surface run off is arrested and the rain received effectively and quickly soaks into the deeper layers of soil below the ground surface.

Threshing paddy with tractor.—There are considerable variations in the practice of threshing paddy in the different rice growing tracts. In the Southern Districts paddy threshing is done in two ways. Initially grain is separated by beating the sheaves on the ground and what is left after this beating is subsequently trodden by cattle. In Malabar and South Kanara, the sheaves are beaten out on boards and subsequently beaten again with sticks. The common factor in all these practices is the employment of manual or animal power.

The cost of these operations is high as a large number of cattle and men are required. On an average it is estimated that about 30 pairs of cattle working for about 8 to 10 hours a day would be required for threshing paddy got from 10 to 12 acres.

An attempt has been made to thresh on a bulk basis paddy with the aid of rubber tyred tractors by driving the tractor round and round on the spread out sheaves at a slow speed of 4 to 5 miles per hour which however is much faster than the normal speed at which cattle move round. The high clearance off the tractor and the weight of tractor aided by the rubber tyred wheels have resulted in the expeditious and economical completion of paddy threshing operations resulting in both saving of time and operational charges to an appreciable extent.

The results of these exploratory trials further show that during a full day's working nearly 200 bags of paddy can be threshed with the help of a tractor and the cost and time of threshing paddy amount about to less than one third of the cost of threshing by the usual cattle and manual labour.

Assistant Agricultural Engineers.—A statement showing the jurisdiction of the different Assistant Agricultural Engineers is shown in appendix 17.

The Assistant Agricultural Engineers have toured in all for 1,742 days during the year in the districts assigned to them. As a result of the frequent periodical inspections by the Regional Assistant Agricultural Engineers in the various districts assigned to them a detailed check and inspection over the various operations, maintenance and outturn of every individual machine was carried out in a systematic manner. Prompt attention was paid to put into commission machinery which needed repair or renewal of parts with the materials available locally and from Tractor Workshops, Bapatla and Coimbatore.

During the year under report the Assistant Agricultural Engineers have given instructions to the tractor divers and cleaners during their tours on the correct method of handling and lubricating the machines and explained to them the operational function of the various parts and how best to maintain the machines by systematic lubrication.

The Assistant Agricultural Engineers, Anakapalle and Madurai, have been placed in district charge of the Engineering activities in the districts of Madurai and Visakhapatnam and an experimental measure so as to raise the level of efficiency of operations and maintenance and a separate report on this has been submitted to Government.

Tungabhadra Project.—The departmental tractors and bull dozers were engaged in the clearance of the selected forest areas and the subsequent levelling, ploughing, bunding and other operations. The operations to be performed are uprooting of trees and scrub clearance of the area in terraced fashion, bunding, ploughing, harvesting and sowing, if necessary. The total forest area reclaimed by the use of the departmental tractors up to 30th June 1953 is 7,269 acres. Work is being concentrated in this area to clear the extent feasible and the work is expected to be completed shortly.

Government have also sanctioned a pilot scheme for mechanised reclamation and terracing with tractor unit over a compact block of about 6,000 acres in Kampli area, Bellary district, which lies in the localised area of over 19,000 acres of land round about Kampli ayacut in the Tungabhadra Project zone. It is proposed to divert 24 tractors from other districts for this special work.

Supply of tractors under hire-purchase system.—Spectacular advantage has been gained in other more advanced countries by the application of machinery to Agriculture and this has raised the rural living standards. There is no doubt now that the trend of mechanisation is steadily and systematically increasing in the State. The rate of this natural development will doubtless depend upon the finances that could be commanded the availability of standard dependable type of machinery and matched equipment and the rate at which trained operating personnel could be recruited, by the users. From private agriculturists also there is very keen demand to purchase and have their own tractors according to their own free choice but on account of the present high capital expenditure only very few are able to purchase them on a cash down basis. There are gradually increasing number of requests for extending easy credit facilities in the case of supply of tractors. This scheme aims at supplying tractors together with the matched implements on instalment repayment system spread over 7 years. So far 34 tractors have been supplied under hire purchase system and it is proposed to extend the scheme.

Out of 34 tractors supplied under hire purchase system 28 units are being taken delivery by the ryots. Six units have been distributed in the year 1951-52. The outturn of these tractors from the date of supply up to 31st March 1953 is 1,111-43 acres. The outturn of the tractors cannot however be judged so soon solely by the area tackled during last year, in view of the continued severe drought and famine conditions in the uplands of Kurnool, Chittoor, Coimbatore, Guntur and Nellore in particular.

Famine relief.—In order to distribute drinking water to the people in the famine affected areas 10 tractor trailer tankers have been distributed as under :—

Collector of Chittoor	.. .. .	5
Collector of Coimbatore	.. .. .	2
Collector of Guntur	.. .. .	3

As the situation has improved the 8 of the above tractor trailer tankers have been withdrawn from Chittoor and Guntur districts from 1st January 1953 and 15th January 1953 respectively. Out of this one unit has been sent to Coimbatore.

A statement showing the tractors and implement available with the department from 1945-46 to 1952-53 is enclosed in Appendix.

Cyclone relief work.—Due to cyclone a large number of avenue trees on the roadside had fallen causing hindrance to the traffic in Tiruchirappalli district. At the request of the local Highways Department, departmental tractors with bull graders were engaged for the clearance of trees uprooted during the cyclone for about a fortnight and thus help the speedy restoration of road communication.

Sugarcane Development Scheme.—The four units intended for the improvement of sugarcane cultivation worked in the districts of Bellary, South Arcot and Visakhapatnam. The outturn of these units is shown below :—

Total area ploughed in acres	.. .. .	493.60
Total area harrow in acres	.. .. .	137.00
Total area ridged in acres	.. .. .	53.75
Total area of dry ploughing done in paddy fields.	.. .. .	280.00
Quantity of sugarcane hauled by the use of tractor trailers	.. .. .	200 tons.
Total outturn by the use of cultivators	.. .. .	17.50
Number of ryots benefited by the use of tractors	.. .. .	77 numbers.

Out of the four units allotted to the sugarcane areas there was little demand in North Arcot and Krishna districts, during the year since this was not the ploughing or planting season for sugarcane. Apart from non-seasonal factor there was very severe drought in the districts of North Arcot and South Arcot almost bordering severe famine conditions. The serious failure of rains during the last six years in these two districts has caused a great depletion in the water in four-supplies of irrigation wells and this decrease in water-supply has in turn adversely affected the sugarcane areas planted under them similarly. Further, the fixation of a low price for sugarcane has to some extent contributed to the comparatively low demand.

Experiments and trials.—For the testing of modern implements for seed bed preparation one W.D. 9 tractor with four different implements were tried on 13th June 1952 at the Agricultural Research Station, Koilpatti, on 5 acres and 40 cents divided to five equal plots of 1 acre 8 cents.

Details regarding the germination of crops in the five cultural treatments are furnished below :—

Serial number and name of implement worked.	Average germination in a standard measurement of 4 feet.	Remarks.
(1)	(2)	(3)
1 Monsoon plough Harrow	3.2	Germination poor.
2 Harrow plough	3.0	Do.
3 Disc plough	6.4	Fair.
4 Mould Board plough	10.0	Good.
5 Disc plough	10.6	Do.

The above germination counts indicate that the deeper cultivation with the mechanised implements tends to give better germination during the year of low rainfall.

Exhibition.—The Agricultural Engineering Section participated in all the All-India Khadi Swadeshi and Industrial Exhibition held at the Congress Grounds, Teynampet, from 18th December 1952 to 8th February 1953 and also on the 6th Engineering Exhibition held at the Engineering College, Guindy, from 31st December 1952 to 6th January 1953. Different types of Agricultural implements labour-saving machines, tractors and matched implements, oil engines, etc., with sketches, diagrams, etc., were exhibited.

Tractor workshops.—In addition to the two tractors workshops at Coimbatore and Bapatla one more workshop at Bellary to cater to the needs of Rayalaseema districts was sanctioned during the year in G.O. Ms. No. 1,382, Food and Agriculture dated 27th August 1952. The three workshops functioned during the year and the main items of work consisted servicing overhauling and repairing of tractors, bull dozers, departmental vehicles and agricultural implements. Reconditioning and manufacture of spare parts required for different districts were looked into and arrangements made for their supply both from makers and from the workshops. The Assistant Agricultural Engineers at Bapatla and Coimbatore continued to be in charge of the district engineering activities. Organization of stores and their accounting on the basis of carded system has been sanctioned by Government and will be put into operation.

(i) *Tractor Workshop, Coimbatore.*—The cut on electric consumption was restored which tended to accelerate the progress of work at the workshop during the year under report. The Morgans Foundary equipment was received and is awaiting erection. Among other equipments, mention may be made of (1) an exhaust fan, (2) taps and dies set and (3) slotting attachment. In order to minimise the leakage of R.S.D. oil a consumer pump was installed at the workshop premises. A total number of 255 items of spare parts were manufactured and 291 items reconditioned. Refresher classes in tractor maintenance and operation for District Agricultural Officers were held as per Government orders where they were given training on maintenance of tractors and other equipments. They were given practical training also in operating a tractor and a bull dozer. A new batch of B.Sc. (Ag.) Supervisor students selected for Agricultural Engineering Supervisor training was trained at the workshop in tractor driving maintenance care, operation and repairs.

(ii) *Tractor Workshop, Bapatla.*—The workshop was equipped with (1) Morgan Oil fired crucible furnace with air blower and other accessories and (2) battery charger capable of charging 10 Numbers 6 volts accumulators at a time during the year. Servicing of 50 units of tractors, implements, etc., was completed. About 271 work orders for manufacturing spares numbering 770 parts were carried out for the various machinery. About 372 work orders for repairing and servicing of 662 parts were also executed in the year under report. Trials were conducted on Roto dig scraper to determine the fuel consumption, reasonable hire charges on the units and scope of its work. A special training course was given to four Agricultural Engineering Supervisors towards installation of filter points by the casing method. Practical training was given at the workshop in the use of tools, tract servicing, etc., for trainees in the scheme of training for tractor drivers.

(iii) *Tractor Workshop, Bellary.*—This workshop was a new addition to the department sanctioned during the year. The actual functioning of the workshop commenced during the latter half of the year. It is not yet fully equipped with the required machinery. Fourteen tractors were serviced and repairs carried out. Overhauling of tractors, repairs to tillage implements and oil engines were also undertaken. Manufacture of spares could not be tried for want of equipment. Much head way could not be made for want of machinery, etc.

In respect of tractors employed for agricultural development the Planning Commission's recommendations state that each Government should see that adequate facilities are provided either by the dealers or the State Workshop for supply of necessary spares and for carrying out the urgent repairs. This would reduce breakdown avoid dislocation of work and lead to better utilisation of equipment. Another recommendation made in this connection is that the State machine tractor stations and workshops should also have a section for undertaking repairs to indigenous and small implements and machinery. Spare parts needed for such implements should also be supplied by them.

A list of machineries and tools purchased during the year under report is shown in Appendix No. 16.

XXII. FINANCE.

The receipts and expenditure for the financial year 1952-53 and the corresponding figures for the previous year are given below :—

	1951-52	1952-53
	IN LAKHS.	IN LAKHS.
1 Expenditure 40. Agriculture	316.49	261.76
2 Receipts XXIX Agriculture	110.95	135.28
3 Takkavi Loans (according to fasli year).	..	..
4 For improved seeds and manure ..	31.51	30.33
5 Agricultural implements	19	27
6 Intensive Manuring Scheme Distribution of chemical manures.	71.03	77.97 *

* This includes a sum of Rs. 5,32,072 disbursed in June 1953 (i.e.,) Intensive Manuring Scheme for 1953-54 first month.

EXPENDITURE—AGRICULTURE.

There has been an over-all decrease of expenditure amounting to Rs. 54.73 lakhs during the year under report. The decrease is mainly due to (i) postponement of purchase of machinery equipments and tractors for want of Government's sanction in time, and general restriction in the indents for spare parts under 40. f. Agricultural Engineering, (ii) non-purchase of seeds under Seed Development Scheme as per programme, (iii) savings under crop and plant protection, and (iv) general economy and small savings under other items.

RECEIPTS—XXIX. AGRICULTURE.

The excess receipts are due to general increase under research stations and recovery of overpayments and general increase under other items in view of the all-round expansion of the departmental activities.

XXIII. SALIENT FEATURES OF WORK DONE AND OUTSTANDING ACHIEVEMENTS DURING THE YEAR 1952-53.

Season.—The year under report was one of deficit rainfall with famine conditions prevailing in the Central and Southern districts. Tanjore district was affected by a cyclonic storm.

Propaganda and Publicity (Extension work).—*Intensive cultivation schemes.*—The District propaganda staff attended to the successful execution of the various intensive cultivation schemes, cotton extension, sugarcane development, etc., and the extensive propaganda on Japanese method of Rice cultivation modified to suit Madras conditions. Eleven thousand one hundred and thirty-nine tons of paddy seeds, 252 tons of millets seeds, 19 tons of pulses seed and 91,715 tons of sulphate of ammonia were distributed. The scheme of sinking filter point tube wells to make use of sub-soil water was put through on an expanded scale and 725 tube wells were sunk against a target of 600. Five hundred and eighty-three loans were sanctioned for fitting up these wells with oil engine and electric motor pumpsets. Ninety four thousand and eighty acres were effectively green-manured with *sesbania speciosa* and a large number of glyricidia plants established in ryots' fields for green leaf supply. The crop competition fortnight and Vanamahotsava week were celebrated successfully. The increase in food-grain production on account of the several Government aids distributed during the year is estimated at 256,780 tons.

Plant protection.—The areas under food and other crops wherever pests and diseases were noticed control measures were successfully adopted.

Bee-keeping.—One thousand seven hundred and eighty-one new colonies were hived. Four thousand seven hundred and eighty-three bee colonies were maintained and 51,207 lb. of honey was extracted from these.

Agricultural marketing.—A new grading station for ghee was opened at Coimbatore. The 12 regulated markets functioned well during the year. Data on production, supply, movements, price, etc., of several commodities were collected. Cloth was decontrolled and the Tanjore Tenants and Pannayals Protection Act was promulgated and extended to Chidambaram taluk of South Arcot district. Prices of commodities and market conditions were studied.

Cotton Extension Plan.—The cultivation of cotton in the single crop paddy lands of the off season January to July has become popular in Tanjore, Tiruchirappalli and South Arcot. An area of 71,854 acres was estimated to have been covered in the State by improved seed procured and distributed.

Colonization Schemes.—The Araku Valley Scheme continued to be in operation and the main work consisted in improvements of local crops and introduction of new crops; 102 acres were reclaimed and 410 acres were tractor ploughed.

Wynaad.—Introduction of suitable strains of paddy, fruit plants, land reclamation and filter point tube wells were in progress.

Tunghabhadra Project.—Chemical investigation on the effect of irrigation on black soils was continued. Trials with paddy varieties to select suitable ones were continued. AKP. 2 and GEB. 24 have recorded

maximum yields. The ryots of the Bagawadi Demonstration Farm adopted improved methods of raising crops under irrigation.

Community Projects.—Programme of work for the six project centres was drawn up. Three training centres were opened at Kakinada, Palghat and Dindigul for training village level workers.

Agricultural Engineering.—A tractor workshop at Bellary was set up. The scheme for supply of oil engines and electric motors was continued as also "The River Pumping Scheme". Two power boring sets have been acquired and are working at Pattukottai. Pipes were decontrolled during the year and are being sold at market rates. Fifty lorries and 47 jeeps are in use.

Soil conservation.—Schemes were in operation in the districts of Chittoor, Nilgiris, Bellary, Anantapur and Coimbatore. The Chittoor and Coimbatore soil conservation work was done as a famine relief measure.

Research—Research Council.—Twenty-nine meetings were held. Half-yearly and annual programmes of work and cropping schemes were scrutinised as also five research schemes.

Agricultural Chemistry.—Two thousand seven hundred and sixty-four samples were analysed. Water samples from South Arcot district bore wells were analysed. Soil samples (pre and post-harvest) from Tanjore delta analysed revealed that nutrient salts did not suffer as a result of growing cotton in paddy fallows. Studies on soils were continued.

Plant Physiology.—Pre-treatment of seed with nutrient solutions were in progress as also weed control studies.

Entomology.—Experiments to control paddy stem borer, paddy jassids, cholan fly, sugarcane borer and vegetable pests were in progress. Breeding and release of "*Redolia cardirelis*" on the Nilgiris and Kodaikanal to check the fluted scale was in progress. B.H.C. spray and dust were very effective in controlling "Sap Jose scale". Trials on new insecticides and chemicals were continued.

Mycology.—The relative resistance of 300 cultures of rice to blast disease was assessed and a highly resistant strains ADT 25 has been released. Resistance to cereal rusts of wheat, cholam, cumbu and tenai were studied.

Meteorology.—Under the All-India Coordinated Crop Weather Scheme, meteorological and crop growth data were collected to predict outbreak of pests and diseases. Six crop weather stations functioned during the year.

Paddy.—Six new strains ADT. 25, TRM. 6, MGL. 2, PCH. 31 and 32 MTU. 22 were released during the year. In the district trials culture, Halluga in South Kanara gave 10 to 20 per cent increased yield and is awaiting release.

Millets.—Improved cultures of cholam, ragi, cumbu, and tenai were under trial. AS. 8008 Talaivirichan cholam and AS. 7081 Periamanjai varagu have established their superiority and are awaiting release. Selections EC 4601 and EC 4573 ragi strains will be issued as strains shortly. Varagu Co. 1 and Pani varagu P.V. 14 were issued for trial in the district.

Pulses.—Six high yielding and good quality types of lab-lab, one of cowpea and two of cluster beans were multiplied and seeds supplied for cultivation. Redgram, blackgram, SA 1 greengram, Co. 1 Bengalgram, Co. 1 and VZM 1 horsegram VZH 1 were the improved strains released during the year.

Groundnut.—Four promising selections. AH 6608, AH 6614 and AH 6615 have been released for trial in Chittoor and Coimbatore districts. Three selections of castor RC 1074, RC 1075 and RC 1076 were sent to Anantapur and Kurnool for trials. One thousand seven hundred and fifty-four nuts of tall and dwarf hybrid coconut were harvested for production of seedlings for distribution; 132,273 selected seedlings were produced and distributed.

Cotton.—P. 216 F. and P. 23 F. cottons have been found to respond well in Tanjore delta while Madras Uganda 1 yields better under Coimbatore conditions. The rainfed black soils MA 2 and Laxmi cotton maintained their superiority over local in yield and ginning percentage.

Sugarcane.—Out of 119 varieties under study Co. 887, Co. 888, Co. 859, Co. 864, Co. 732 and Co. 810 were found promising. Co. 527 and 449 are becoming popular on account of their resistance to smut. Four Liaison farms were functioning during the year.

Fruits.—Twenty promising mango hybrids have been isolated. Grafts of these are greatly in demand. Four promising varieties of peach were multiplied for distribution to ryots. Spraying apple trees with linseed oil and Sandoline A during dormancy was found to hasten blossoming and promote yield. Seed multiplication of determinate types of Canadian tomatoes is in progress.

Banana.—One hundred and fifty varieties are under study. Five thousand one hundred and seventy-nine suckers of 84 varieties were distributed. A large number of inter-specific crosses are under study.

Pepper.—Twenty-eight varieties and types have been planted out. Three types of Kallu valley two of Balancotta and one of Kottandan and one wild species, "*Pepper attenuatum*" were located. Hand watering of vines in March developed spikes in May. This will be made use of in forcing spike development in the dry season. Studies on Pollu disease and wilt are in progress.

Cardamom.—The lower Palnies, Annamalais, Sivagiri, Kamikatti and Kattalaimali and cardamom hills were surveyed and six types of cardamom were collected and sown; 266 crosses have been made.

Chillies.—G. 1. strain continued to be superior in yield. G. 1. 222 a re-selection was found to be the best among the cultures tested. One hundred and forty-three varieties were studied in observation plots. BHC 56 per cent spraying gave effective control over thrips.

Coriander.—Strain 731 continued to maintain its superiority.

Systematic Botany.—One thousand two hundred and twenty-two specimens were identified. One thousand four hundred specimens were incorporated in the Herbarium. The Botany Department of the Jerusalem University presented to the Herbarium 100 specimens which were a valuable addition.

Botanic Gardens and Parks.—Ornamental plants were multiplied and distributed and the gardens were maintained in form. Essential oils, lemon grass and Eucalyptus were extracted.

Agricultural Engineering.—Howards Rotovater was found to cut the green manure crop and incorporate it in the puddle. A pedal operated paddy thresher fabricated on the Japanese model was found satisfactory.

Agro-Industries.—The malt factory was closed on 31st January 1953. Installation of the water storage tank and steam boiler at the fruit products laboratory at Kodur were completed. Neelum and Beneshan mangoes canned in bulk lots showed good keeping quality and Alphonso mango yielded satisfactory canned product.

APPENDICES.

Number and particulars.

Rainfall statement.

Statement showing the distribution of Grow More Food aids 1952-53.

(a) Three year plan of Intensive Cultivation Scheme—Progress made in 1949-50.

(b) Do. do. 1950-51.

(c) Do. do. 1951-52.

(d) Intensive Cultivation Schemes 1952-53 as assessed by the Commissioner of Food Production, Financial year 1952-53.

(e) April to June for the year 1953-54.

(f) Seed multiplication scheme for 1952-53.

Quantum of extension work on sugar-cane.

Statement showing the progress grading working in 1952-53.

List of Sugar Factories in Madras State.

Crop cutting survey 1952-53 results paddy—

(a) Do. .. First period.

(b) Do. .. Entire period.

(b) (i) Do. .. Second period.

(b) (ii) Do. .. Third period.

(c) Do. .. Irrigated ragi first-crop 1952-53 results.

(c) (i) Do. .. Unirrigated cholam 1952-53 results.

(d) Do. .. Irrigated cumbu.

(e) Do. .. Unirrigated cumbu.

(f) Do. .. Results of analysis of Grow More Food and experiments conducted during 1952-53.

(g) Statement showing the figures of acreage and yield of food crops in Madras in 1952-53.

Area under improved strains of crops.

Financial aid to farmers statement showing loans disbursed during 1952-53.

Pipes supply to ryots during the year 1952-53.

(a) Distribution of tractors and bull-doers.

(b) Particulars of types of tractors and bull-doers.

(c) Types and models of tractors.

Districtwise out-turn of tractors and bull-doers.

Progressive increase in the hire charges of tractors and bull-doers.

Acreage tackled by Departmental tractors 1946-47 to 1952-53.

Tractors and implements available with the department. Proforma statement.

Machinery purchased during the year.

Statement showing the jurisdiction of Assistant Agricultural Engineers.

Statement of expenditure and receipts of Agricultural Research Stations.

List of Agricultural Schemes in Madras State.

Programme of work 1953-54.

Gazetted Officers—Appointments—Postings and transfers.
Officers who were on leave.

Upper subordinates in the department.

Glossary.

APPENDICES

APPENDIX No. 1.

Statement comparing the actual rainfall (in inches) during the south-west and north-east monsoon and hot weather periods with normal rainfall in 1952-53.

District.	South-west monsoon.				North-east monsoon.				Percentage of deviation from the average + or -						
	June.		July.		August.		September.			October.		November.			
	Average.	Actual.	Average.	Actual.	Average.	Actual.	Average.	Actual.		Average.	Actual.	Average.	Actual.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Srikulam ..	5.1	2.6	6.4	6.5	7.5	6.0	7.8	9.2	26.8	24.3	9.3	7.1	10.9	2.7	9.3
Visakhapatnam ..	4.5	3.9	5.8	5.0	6.6	3.8	7.3	4.2	22.2	17.0	—	7.6	11.2	3.4	—
East Godavari ..	5.0	5.5	6.9	4.2	6.2	2.7	6.9	3.2	25.0	15.6	—	8.5	13.1	4.8	—
West Godavari ..	5.1	4.3	7.1	4.4	7.1	5.8	7.0	4.0	27.0	18.5	—	6.8	7.5	3.2	—
Krishna ..	4.4	2.5	7.0	3.2	6.5	5.3	6.2	3.7	24.1	14.7	—	6.1	6.8	3.3	—
Guntur ..	3.8	0.9	4.6	2.4	4.9	2.8	5.7	2.9	18.5	9.0	—	6.2	6.3	4.0	—
Kurnool ..	2.6	1.3	3.8	2.6	4.0	2.3	5.3	1.8	15.7	8.0	—	3.8	3.8	1.8	—
Bellary ..	2.3	0.4	2.6	1.6	3.6	1.4	5.2	1.9	12.9	5.3	—	3.8	8.0	1.4	—
Anantapur ..	2.1	1.1	2.2	2.0	3.3	1.5	5.2	2.4	12.9	7.0	—	4.0	4.2	1.9	—
Cuddapah ..	2.4	1.7	2.2	2.3	4.0	3.0	4.1	1.5	14.6	8.9	—	5.0	4.7	3.7	—
Nellore ..	1.6	1.7	2.6	1.3	2.9	2.4	4.1	1.8	11.2	7.1	—	3.7	4.2	9.3	—
Chingleput ..	2.0	1.5	3.5	2.2	5.0	5.1	5.7	1.0	15.7	9.8	—	8.9	6.8	12.1	—
South Arcot ..	1.8	1.0	2.9	2.2	5.4	5.2	5.4	2.4	15.8	8.8	—	6.1	5.7	6.0	—
Chittoor ..	2.4	1.2	3.4	2.1	5.3	4.5	6.5	2.0	17.6	10.6	—	8.9	4.7	6.4	—
North Arcot ..	2.4	1.2	3.4	2.1	5.3	3.0	5.3	2.5	14.3	8.8	—	6.1	5.6	8.5	—
Salem ..	2.2	1.1	2.5	2.4	4.3	4.4	3.0	1.8	7.9	11.0	—	6.1	5.6	4.0	—
Coimbatore ..	1.4	0.6	1.5	2.6	2.1	4.4	2.9	2.5	14.3	9.4	—	6.6	3.2	4.4	—
Tiruchirappalli ..	1.4	1.1	1.6	5.0	3.7	1.0	4.9	1.3	11.6	8.4	—	7.1	5.6	5.9	—
Tanjore ..	1.4	0.6	1.9	4.7	3.8	2.8	4.2	0.7	11.3	8.3	—	8.2	4.0	11.6	—
Madurai ..	1.3	0.6	1.4	5.0	2.7	1.3	3.5	2.2	8.9	5.5	—	7.3	4.5	6.1	—
Ramanathapuram ..	0.9	0.3	1.2	1.5	2.4	1.7	2.8	0.9	7.2	4.4	—	7.1	4.8	7.9	—
Tirunelveli ..	0.8	0.2	0.7	2.2	0.8	0.4	1.1	0.7	3.4	1.5	—	6.7	2.3	3.2	—
Malabar ..	30.4	27.2	38.9	22.4	18.6	16.7	8.3	1.2	91.2	67.5	—	10.3	12.7	5.4	—
South Kanara ..	39.3	44.0	47.5	34.1	20.7	23.4	12.4	2.3	128.4	108.8	—	9.2	19.6	8.2	—
The Nilgiris ..	9.4	5.6	14.5	9.1	10.6	5.6	7.1	3.1	41.6	23.4	—	10.7	6.8	6.9	—

Statement comparing the actual rainfall (in inches) during the south-west and north-east monsoon and hot weather periods with normal rainfall in 1952-53—cont.

	North-east monsoon—cont.					Hot weather (From February 1953 up to May 1953).					
	December.		January.		Total.	February.		March.		Total.	
	Average.	Actual.	Average.	Actual.		Average.	Actual.	Average.	Actual.		
Brikulam ..	—0.6	0.1	0.2	1.5	(22)	0.7	0.2	0.6	0.4	(29)	0.4
Vizakapatnam ..	—0.6	0.3	0.3	0.9	(21)	10.6	0.1	0.4	0.6	(32)	5.1
East Godavari ..	—0.4	1.1	0.2	0.3	(20)	11.9	0.4	0.4	0.6	(31)	2.4
West Godavari ..	—0.2	1.4	0.2	0.3	(19)	13.4	0.4	0.4	0.6	(30)	2.8
Krishna ..	—0.3	1.8	0.2	0.1	(18)	9.2	0.4	0.4	0.6	(29)	0.4
Guntur ..	—0.5	3.9	0.3	0.1	(17)	10.4	0.4	0.4	0.6	(28)	1.1
Kurnool ..	—0.3	0.9	0.1	0.3	(16)	9.9	0.4	0.3	0.5	(27)	1.1
Belary ..	—0.2	1.0	0.1	0.1	(15)	11.9	0.2	0.2	0.7	(26)	0.6
Anantapur ..	—0.3	1.4	0.1	0.3	(14)	9.1	0.2	0.2	0.7	(25)	0.6
Cuddapah ..	—0.9	4.0	0.3	0.3	(13)	11.1	0.2	0.2	0.7	(24)	0.7
Nellore ..	2.6	11.0	1.3	0.3	(12)	9.1	0.1	0.2	0.5	(23)	17.9
Chengleput ..	4.6	10.5	1.7	0.3	(11)	24.3	0.5	0.3	0.5	(22)	154.6
South Arcot ..	5.4	11.8	1.7	0.3	(10)	30.9	0.6	0.4	0.4	(21)	18.4
Chittoor ..	1.8	10.5	0.7	0.2	(9)	6.8	0.4	0.2	0.4	(20)	11.5
North Arcot ..	2.3	8.6	0.9	0.2	(8)	14.9	0.3	0.4	0.4	(19)	19.2
Salem ..	1.2	6.2	0.5	0.1	(7)	10.1	0.3	0.2	0.5	(18)	11.1
Coimbatore ..	1.4	4.4	0.4	0.1	(6)	4.3	0.3	0.2	0.5	(17)	9.1
Tiruchirappalli ..	2.7	6.4	1.0	0.3	(5)	86.4	0.4	0.6	0.7	(16)	24.3
Tanjore ..	6.9	8.8	2.2	1.3	(4)	19.8	0.4	0.5	0.7	(15)	30.9
Madurai ..	2.3	3.2	1.0	0.4	(3)	34.3	0.6	0.7	0.7	(14)	2.4
Ramanathapuram ..	3.5	2.0	1.5	0.4	(2)	46.1	0.8	0.8	2.0	(13)	7.1
Tirunelveli ..	3.4	2.6	1.3	0.3	(1)	47.9	0.9	0.9	2.0	(12)	6.8
Malabar ..	1.0	2.6	0.8	1.3	(0)	56.2	1.2	1.5	0.7	(11)	5.5
South Kanara ..	0.6	7.3	0.2	1.0	(-1)	87	0.3	0.9	0.8	(10)	2.2
The Nilgiris ..	2.6	7.3	0.2	1.0	(-2)	58.3	0.1	0.2	0.6	(9)	0.6
						14.9	1.0	1.4	6.0	(8)	2.9
						19.8	3.6	3.6	12.0	(7)	10.5

APPENDIX No. 2.

Statement showing the distribution of Grow More Food aids from 1st July 1952 to 30th June 1953.

Targets.			Name of Scheme.	Achievements.		
Units to be distributed.	Area to be covered.	Estimated additional production.		Units distributed.	Area covered.	Additional productions anticipated (Tons.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
160	1,280	640	Oil Engines ..	2,514	20,112	10,056
3,000	15,000	7,500	Electric Motors ..	1,207	6,035	3,017
O.A.E.S. Section.						
1,500	12,000	6,000	Oil Engines ..	508	3,677	1,835.5
500	2,500	1,250	Electric Motors ..	713	32,071	5,986
35	1,10,000	12,875	Clearance and Reclamation of land by Tractors.			
1,56,000	42,68,000	3,12,000	Ammonium Sulphate ..	85,511	23,94,308	1,71,022
29,000	..	24,166	Phosphatic Fertilisers ..	71,823	..	6,519
1,09,947	21,989	2,749	Rural Compost ..	1,12,671	22,534	2,817
15,160	8,51,140	57,000	Paddy Seed ..	11,139	5,01,255	33,566
2,325	5,95,000	20,071	Millet Seed ..	252	37,800	717
77	18,340	570	Pulses Seed ..	18-1675	5,624	188
40	90,000	8,036	Green Manure Seed (Sesbania).	42	94,080	8,400

APPENDIX No. 3 (a).

Three-year Plan of intensive cultivation scheme—Progress made in 1949-50 (July to June).

Targets.			Name or scheme permanent improvement.	Achievements.		
Unit.	Acres to be covered.	Estimated additional production.		Unit.	Area covered.	Estimated additional production.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
..	1,500	10,000	1. Contour bunding	..	14,641	14,578
241	40,000	..	2. Reclamation by tractors.	..	58,814	..
265	1,500	750	3. Oil Engine pumpsets..	Nos. 224	1,792	896
2,400	12,000	6,000	4. Electric motors	2,397	11,985	5,992
1,000	5,000	2,500	5. Central Agricultural Engineering.	207	1,656	828
Electric motors.	..	..	Stores Oil Engineering Electric Motors.	49	245	128
Oil Engines ..	100	800	6. Improved Paddy seeds tons.	6,109	2,84,752	15,254
(Bags) ..	99,204	8,96,800	7. Improved Millet seeds tons.	106	17,934	340
..	546	5,790	..	..	..	..
Recurring improvements.						
(Tons) ..	45,000	2,60,000	8. Ammonium sulphate tons.	59,952	16,78,656	1,19,904
..	15,000	..	9. Phosphatic manures tons.	16,210	..	13,508
..	42,600	8,520	10. Rural compost tons ..	40,441	8,089	1,011
(Bags) ..	28,000	1,50,000	11. Green manure ..	945	70,842	9,488
1,64,582			1,81,922			

* Only topographical survey of this area has been completed.
N.B.—The above figures relate to the fiscal year both in respect of aids distributed and results achieved.

APPENDIX No. 3 (b).

Three-year plan of intensive cultivation scheme—Progress made in 1950-51 (July to June).

Targets.			Name of the scheme.	Achievements.		
Quantity targetted for distribution.	Area to be benefited.	Estimated Additional production arrived at.		Unit of aid distributed.	Area covered in acres.	Estimated Additional production in tons.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				NOS.		
38	90,000	14,360	Tractor cultivation ..	188	59,662	14,916
350	2,800	1,400	Oil Engine pumpsets ..	706	5,648	2,824
3,000	15,000	7,500	Electric motor pumpsets.	555	2,775	1,889
			<i>C.A.E.S. Hire Purchase.</i>			
1,000	8,000	4,000	Oil Engine pumpsets ..	1,008	8,064	4,032
500	2,500	1,250	Electric motors ..	179	895	448
				TONS.		
96,720	19,344	2,418	Rural compost ..	95,983	19,196	2,400
1,20,000	33,60,000	2,40,000	Ammonium Sulphate ..	95,996	26,87,388	1,91,992
25,000	20,833	..	Phosphatic Fertilisers ..	14,872	..	12,394
12,867	7,20,000	38,580	Improved Paddy Seeds ..	8,211	3,69,495	19,797
823	2,73,800	8,716	Improved Millet seeds ..	301	45,150	856
				L.B.		
31	4,505	141	Improved Pulses seeds ..	2,867	709	23
2,000	2,40,000	30,140	Improved Green Manure seeds.	728	54,600	7,311
		3,50,505				2,58,382

N.B.—The above figures relate to the fiscal year both in respect of aids distributed and results achieved.

APPENDIX No. 3 (c).

(Five-year plan progress made.)

Statement showing the achievements attained during 1951-52—July to June under intensive cultivation schemes.

Targets fixed.	Anticipated area to be covered acres.	Anticipated additional production arrived at tons.	Name of scheme.	Units distributed.	Area covered acre.	Estimated additional production achieved (tons).
(1)	(2)	(3)	(4)	(5)	(6)	(7)
NOS.						
250	2,000	1,000	Oil Engine pumpsets ..	1,179	9,432	4,716
3,000	15,000	7,500	Electric motor pumpsets.	546	2,730	1,368
			<i>C.A.E.S.</i>			
1,500	12,000	6,000	Oil Engine pumpsets ..	784	6,272	3,136
500	2,500	1,250	Electric motor pumpsets.	152	760	383
53	1,00,000	9,250	Tractor cultivation ..	..	44,073	6,069
1,16,000	32,48,000	2,32,000	Distribution of Am/Sulphate.	1,02,114	28,59,192	2,04,228
28,000	..	23,333	Distribution Phosphate manures.	18,036	..	15,032
1,04,706	20,941	2,617	Rural compost ..	90,745	18,148	2,271
14,724	8,25,720	44,167	Paddy seed ..	11,211	5,04,495	27,027
1,974	5,66,375	18,503	Millet seed ..	686	1,02,900	1,951
101	14,340	450	Pulses seed ..	64-1466	19,398	650-1950
3,214	2,38,980	32,224	Green manure seeds ..	1,469	1,09,175	14,757
		3,78,294				2,73,249-1950

N.B.—The above figures relate to the fiscal year both in respect of aids distributed and results achieved.

APPENDIX No. 3 (d).

Statement I.—Intensive cultivation schemes—Supply schemes—Progress report for the period from 1st April 1952 to 30th June 1953 up to 31st March 1953.

Name of the scheme.	Number of units distributed as reported by Collectors 1st April 1952 to 31st March 1953.	Total acreage to be covered by the quantity to be distributed.	Achievement total April 1952 upto 30th June 1953 against distribution in column (2).	Additional production in tons on	Additional production as verified by the Collectors (in tons).
(1)	(2)	(3)	(4)	(5)	(6)
					Total.
I. Distribution of fertilisers—					
A. Ammonium sulphate ..	63,322	1,773,000	1,121,061	126,644	60,342
B. Phosphatic manures ..	8,529	..	..	7,108	3,934
Total ..	71,851	1,773,000	1,121,061	133,752	64,276
II. Distribution of manures—					
A. Rural compost ..	112,335	22,467	98,633	2,808	2,861
B. Urban compost ..	117,493	23,498	17,155	2,937	1,287
C. Green manure seeds ..	242	90,000	57,187	8,036	3,541
Total ..	230,070	135,965	172,975	13,781	7,689
III. Distribution of improved seeds—					
A. Paddy seeds ..	14,156	637,020	345,185	34,126	19,806
B. Millet seeds ..	589	88,350	82,135	5,929	2,030
Total ..	14,745	725,370	427,320	40,055	21,836
Grand Total ..	316,666	2,634,335	1,721,356	187,588	93,801
IV. Irrigation Schemes—					
1. Pumping installations, oil engines and electric motors.	7,851	65,600	36,331	32,787	10,385
2. River pumping schemes ..	8	..	814	1,750	233
V. Land Development Schemes—					
1. Soil conservation and contour bunding.	..	..	..	..	..
2. Clearance and reclamation of waste lands and old fallows with tractors.	314	35,014	45,261	20,873	2,885

N.B.—Figures furnished by the Commissioner of Food Production, Madras.

APPENDIX No. 3 (e).

Statement I.—Intensive cultivation schemes—Supply schemes—Progress report
for the period from 1st April 1953 to 30th June 1953.

1953-54 Schemes.

(Three months.)

Name of the scheme.	Number of units aimed at as per programme for the year.	Number of units achieved.	Total acreage to be covered by the quantity to be distributed.	Acreage actually brought under cultivation.	Additional production to be achieved for the year.	Additional production as verified by the Collectors (in tons).
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. Distribution of fertilisers—						
A. Ammonium sulphate ..	100,000	5,401	2,800,000	35,075	200,000	808
B. Phosphatic manures ..	..	584	..	..	..	..
Total ..	100,000	5,985	2,800,000	35,075	200,000	808
II. Distribution of manures—						
A. Rural compost ..	..	19,325	..	1,487	..	56
B. Urban compost ..	400,000	81,418	80,000	448	10,000	37
C. Green manure seeds ..	..	82	2,000,000	6,046	178,571	12
Total ..	400,892	50,775	2,080,000	7,981	188,571	105
III. Distribution of improved seeds—						
A. Paddy seeds ..	14,567	6,009	898,160	14,286	60,145	1,896
B. Millet seeds ..	2,322	8	601,000	1,862	20,071	21
Total ..	16,889	6,017	1,499,160	16,148	80,216	417
Grand total ..	547,781	62,727	6,379,160	59,204	468,787	825
IV. Land Development Schemes—						
1. Soil conservation and contour bunding. ..	..	..	..	..	..	..
2. Clearance and reclamation of waste lands and old fallows with tractors—hiring schemes. ..	..	59	80,000	4,800	8,750	119
3. Tractors distribution under the Hire-purchase System. ..	50	..	20,000	..	4,000	..

N.B.—Figures furnished by the Commissioner of Food Production, Madras.

APPENDIX No. 3 (f).

Statement showing the varieties of seeds and quantities multiplied in the Seed
Multiplication Scheme for 1952-53.

Name of seed.	Quantity obtained from Nucleus, i.e., from Agri. Res. Stns.		Quantity obtained from primary seed farm.		Quantity obtained from secondary seed farm.		Quantity obtained from non-seed farms.		Quantity sold.	
	TONS.	LB.	TONS.	LB.	TONS.	LB.	TONS.	LB.	TONS.	LB.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Paddy seeds ..	197	1,318	2,088	29	4,366	2,005	771	1,953	12,044	1,709
2. Millets ..	10	1,683	19	1,051	139	179	18	1,138	315	1,882
3. Pulses ..	0	298	..	..	1	123	0	190	1	914
Pulses details—										
1. Bengalgram. ..	0	100	..	..	0	2,146	..	..	0	1,303
2. Redgram ..	0	193	..	..	0	217	0	190	0	1,851
Total ..	0	298	..	..	1	123	0	190	1	914
Millets details—										
Cholam ..	5	1,791	11	1,813	217	1,743	13	2,185	192	631
Gumbu ..	2	1,047	0	2,135	15	2,135	0	2,128	21	1,639
Ragi ..	1	1,206	2	2,175	28	931	2	1,880	25	1,943
Tenai ..	0	2,119	3	1,648	76	2,090	0	1,665	75	2,149
Total ..	10	1,683	19	1,051	339	179	18	1,138	315	1,882

APPENDIX No. 4.

Quantum of extension works on sugarcane, 1952-53.

The achievements recorded in respect of important items are summarized below :—

	ACS.
1 Area worked with improved implements for thorough preparatory tillage. ..	22,254
2 Area worked with tractors ..	2,641
3 Area worked with ridge ploughs ..	23,111
4 Area brought under green manuring ..	6,791
5 Area brought under green leaf manuring ..	4,609
6 Area manured with optimum quantity of concentrated manures. ..	23,732
7 Area worked with bullock drawn implements for inter-cultivation. ..	12,565
8 Area wrapped and propped ..	13,527
9 Area brought under proper drainage ..	11,282
10 Area harvested at proper time ..	22,263
11 Demonstration of better preparation of Jaggery ..	Nos.
12 Construction of improved furnaces ..	2,816
13 Composting cane trash ..	2,618
14 Seed material distributed ..	3,419
15 Area under improved varieties of cane ..	TONS.
	114
	About 98 per cent of the area under cane.

APPENDIX No. 5.

Statement showing the progress of grading work in the Madras State during the fasli year 1952-53 (July to June).

Serial number, name of the authorized packer and centre. (1)	Grading during 1951-52.		Grading during 1952-53.	
	Quantity. Nos. (2)	Estimated value. RS. (3)	Quantity. Nos. (4)	Estimated value. RS. (5)
<i>Eggs.</i>				
1 Messrs. Eggs and Poultry Mart, Madras.	785,697	1,07,280	283,309	36,504
2 Messrs. N. K. Ebrahim Brothers & Co., Madras.	69,727	6,567	455,257	50,517
3 Sri M. Rajoo Chettiar, Madras.	40,608	5,581	1,193	150
4 Sri K. N. Govindaswami Pillai, Madras.	18,563	2,256	11,221	1,379
5 Sri V. C. Inasu, Ootacamund.	15,793	1,922	10,551	1,297
6 Katpadi Co-operative Egg Marketing Society, Katpadi.	149,763	18,618	139,145	17,227
Total ..	1,080,151	1,42,224	900,676	1,07,074

Sathugudi oranges.

1 The Kodur Fruit Growers Co-operative Society, Rajampet.	20,062	2,326	8,450	1,141
2 Messrs. P. V. Reddy & G. Lakshmanaraju, Rajampet.	..	..	Not renewed after 28th February 1953.	
3 Messrs. K. Rami Reddi & V. Narasa Reddi, Kodur.	..	..	Do.	
Total ..	20,062	2,326	8,450	1,141

Serial number, name of the authorized packer and centre. (1)	Grading during 1951-52.		Grading during 1952-53.	
	Quantity. MDS. SRS. (2) (3)	Estimated value. RS. (4)	Quantity. MDS. SRS. (5) (6)	Estimated value. RS. (7)
<i>Ghee.</i>				
1 Sri P. Srinivasa Rao, Ongole.	757 6	1,29,186	823 15	11,33,739
2 Messrs. Amarchand Gulabchand & Co., Tirupur.	3,919 20	7,09,245	5,182 26	8,97,300
3 Messrs. Dhanalakshmi & Co., Tirupur.	1,591 20	3,10,145	3,599 32	6,43,682
4 Messrs. Lakshmidas Premji, Guntur.	280 11	50,965	768 15	1,32,922
5 Messrs. A. S. Arunachalam, Madurai.	34 1	6,248	277 8	46,645
6 Messrs. Lingam & Co., Coimbatore.	..	..	43 8	8,208
Total ..	6,582 18	12,05,787	10,694 24	18,62,496

Potatoes.

1 Messrs. N. R. Rangaswamy Naidu and Sons, Ketti.	8,750 0	1,28,373	10,664 34	1,87,842
2 Sri M. N. Ponnuswamy, Mettupalayam.	..	..	6,245 0	1,19,465
3 Nilgiris Co-operative Marketing Societies, Mettupalayam.	..	..	..	..
Total ..	8,750 0	1,28,373	16,909 34	2,96,807

Grand total value .. Rs. 14.8 lakhs.

Rs. 22.7 lakhs.

APPENDIX No. 6.

List of sugar factories in the Madras State which manufactured white sugar from sugarcane during 1952-53 crushing season.

Serial number and name of the factory. (1)	Location. (2)	District. (3)	Actual crushing period		Average daily crushing capacity. (4)	Total quantity of cane crushed. (7)	Number of licences granted under section 6 of the Sugar Act. (8)	Average sugar recovery percentage. (9)	Grade or grades of sugar manufactured, I.S.S. (10)
			From	To					
1 Sri Rama Sugars and Industries, Limited.	Seethanagaram ..	Srikakulam	2nd January 1953.	16th March 1953.	300 TONS.	21,253-13-1-1	6	10.73	28E, 28D, 28F, 29E, 29D, 27D and 27E.
2 Sri Rama Sugars and Industries, Limited.	Bobbili ..	Do.	28th December 1952.	22nd March 1953.	450	33,904-10-0-26	5	9.47	27E, 27D, 28E and 28D.
3 The Ethikoppaka Co-operative Agricultural and Industrial Society, Limited, Factory No. I.	Ethikoppaka ..	Visakhapatnam ..	19th December 1952.	21st January 1953.	65	1,923-1-1-22	2	8.56	26E, 27E and 28E.
4 The Ethikoppaka Co-operative Agricultural and Industries Society, Limited, Factory No. II.	Darlapudi ..	Do.	22nd January 1953.	19th March 1953.	450	16,030-4-0-18	15	9.87	27E and 28E.
5 The Visakhapatnam Sugars and Refineries.	Thummapala (Anakapalle).	Do.	19th December 1952.	21st March 1953.	400	25,457-15-0-23	4	8.78	27E.
6 The Deccan Sugar and Abkari Company, Limited.	Samalkot ..	East Godavari ..	30th December 1952.	11th April 1953.	500	55,603-52	11	9.84	28E.
7 The Kirlampudi Sugar Mills, Limited.	Pithapuram ..	Do.	8th December 1952.	6th April 1953.	600	57,112-0-2-21	12	9.06	27E, 28E and 29E.
8 The K.C.F., Limited	Vuyyur ..	Krishna ..	14th December 1952.	8th May 1953.	1,150	137,003-0-0-0	7	9.63	28E, 28D, 27E and 29E.
9 The India Sugars and Refineries, Limited.	Hospet ..	Bellary ..	16th November 1952.	10th April 1953.	650	89,659-59	3	10.51	28D, 27E and 28E.
10 The East India Distilleries and Sugar Factories, Limited.	Nallikuppam ..	South Arcot ..	21st December 1952.	10th June 1953.	1,700	308,671-0-0-0	9	8.91	27E and 28E.
11 The Deccan Sugar and Abkari Company, Limited.	Pugalur ..	Tiruchirappalli ..	17th January 1953.	1st February 1953.	750	5,982-97	10	7.03	..
12 The Madurai Sugars and Allied Products, Limited.	Arumayanaikanur.	Madurai ..	10th January 1953.	31st January 1953.	300	3,700-1-1-21	1	6.04	27E.
13 The Andhra Sugars, Limited.	Tanuku ..	West Godavari ..	26th November 1952.	20th March 1953.	600	20,526-10-2-19	13	11.35	27E, 27D, 28E and 28D.

APPENDIX No. 7 (a).

Crop-cutting surveys by the random sampling method.

State—Madras.

Year—1952-53.

Crop—Paddy first period.

Statement showing the estimate average yield—Sampling error and total production.

Districts.	Number of experiments planned.	Experiments conducted for analysis.	Estimated average yield of rice in lb./acre.	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Production of rice in '000' tons estimated.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Chittoor	10	10	1,044.9	171.12	16.4	6
2 Chingleput	16	16	1,062.6	120.01	11.3	21
3 North Arcot	20	18	1,457.6	119.97	8.2	33
4 Salem	10	10	1,928.0	173.84	9.0	21
5 Coimbatore	16	15	1,087.2	231.68	21.3	12
6 Madurai	16	12	1,648.6	176.01	10.7	21
7 Malabar	68	66	828.5	53.00	6.4	174
8 South Arcot	16	16	1,134.3	28.03	2.5	26
9 Tanjore	32	32	935.4	115.71	12.4	41
10 Tiruchirappalli ..	16	16	1,513.0	207.92	13.7	16
11 Tirunelveli	20	20	1,504.3	278.77	18.5	46
12 South Kanara	60	56	879.8	58.75	6.7	130
State (for districts covered by the survey).	300	287	1,002.1	34.75	3.5	547
State	..	..	..	..	..	693

NOTE.—Allowance for area occupied by bunds not made.

APPENDIX No. 7 (b).

Statement showing the results of crop cutting experiments on paddy for the entire year, 1952-53.

District.	Number of experiments.		Average yield of paddy in lb. per acre.	Percentage of Standard error.	Production of paddy in '000' tons.	
	Planned.	Conducted for analysis.			Estimated.	Official (as per final forecast report).
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Srikakulam	100	94	1,235.8	4.9	279	267
Visakhapatnam	100	96	613.0	9.7	82	136
East Godavari	120	102	1,349.9	6.5	422	522
West Godavari	120	112	1,748.1	7.5	609	597
Krishna	100	96	1,489.1	6.3	452	488
Guntur	80	68	2,181.2	6.1	451	294
Circars	620	568	1,498.9	6.7	2,295	2,304
Kurnool	70	64	1,237.3	11.5	45	40
Bellary	70	62	1,742.8	8.3	30	21
Anantapur	70	56	2,038.2	10.3	90	57
Cuddapah	70	66	1,549.4	10.0	67	61
Deccan	280	248	1,643.6	9.7	232	179
Nellore	100	72	1,341.9	11.0	243	221
Chingleput	130	110	1,376.4	9.2	306	204
South Arcot	116	100	1,463.6	2.4	321	249
Carnatic	346	282	1,397.2	7.4	870	674
Chittoor	108	102	1,721.8	7.4	122	88
North Arcot	120	111	1,804.2	5.9	261	181
Salem	80	80	2,329.0	7.2	160	103
Coimbatore	80	69	2,171.5	8.7	118	81
Tiruchirappalli	106	91	1,546.4	7.0	293	266
Central	494	453	1,806.9	6.5	954	719
Tanjore	186	186	1,345.2	4.2	801	885
Madurai	120	92	1,484.3	8.6	207	172
Ramanathapuram	120	90	696.7	13.4	97	118
Tirunelveli	120	98	2,113.6	6.9	293	193
South	546	466	1,380.7	5.1	1,398	1,368
Malabar	162	156	1,111.2	4.8	416	445
South Kanara	120	114	1,233.3	5.4	303	325
Nilgiris	6	6	2,181.6	22.9	7	6
West Coast and Hills ..	288	276	1,165.4	4.9	726	775
State	2,574	2,293	1,452.4	2.5	6,475	6,019

APPENDIX No. 7 (b) (i).

Crop-cutting surveys by the random sampling method.

State—Madras. Year—1952-53. Crop—Paddy second period.

Statement showing the estimated average yield sampling error and the total production.

Serial number and districts.	Number of experiments.		Estimated average yield in lb./acre (in terms of dried and cleaned produce rice).	Standard error of the estimated average in lb./acre rice.	Percentage of standard error.	Production in '000' tons estimated.
	Planned.	Considered for analysis.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Srikakulam ..	100	94	826.38	40.16	4.86	179
2 Visakhapatnam ..	100	96	391.71	39.95	10.19	50
3 East Godavari ..	80	80	1,113.85	77.09	6.92	160
4 West Godavari ..	100	100	1,268.96	94.14	7.42	375
5 Krishna ..	100	96	997.69	62.48	6.26	303
6 Guntur ..	80	68	1,561.72	89.33	5.72	284
7 Kurnool ..	70	64	847.25	94.93	11.21	26
8 Bellary ..	58	56	1,199.67	153.30	12.78	18
9 Anantapur ..	50	40	1,359.78	182.38	13.41	29
10 Cuddapah ..	70	66	1,070.56	103.31	9.65	41
11 Nellore ..	100	72	894.95	99.20	11.08	162
12 Chingleput ..	90	82	881.50	87.14	9.89	147
13 South Arcot ..	84	72	953.03	23.95	2.51	163
14 Chittoor ..	78	74	1,116.10	68.84	6.17	51
15 North Arcot ..	80	76	1,232.25	88.94	7.22	117
16 Salem ..	62	62	1,458.15	145.73	9.99	75
17 Coimbatore ..	56	46	1,524.27	138.18	10.05	63
18 Tiruchirappalli ..	78	68	972.70	78.35	8.05	162
19 Tanjore ..	154	154	900.95	39.45	4.38	490
20 Madurai ..	104	80	993.57	93.34	9.39	96
21 Ramanathapuram ..	120	90	445.21	62.31	14.00	62
22 Tirunelveli ..	100	78	1,550.18	89.32	5.76	135
23 Malabar ..	86	84	640.10	45.15	7.05	103
24 South Kanara ..	60	58	746.43	67.00	8.98	72
25 The Nilgiris ..	6	6	14,61.65	334.37	22.9	5
State (for districts covered by the survey).	2,066	1,862	1,021.92	27.5	2.7	3,368

NOTE.—Allowance for area occupied by bunds not made.

APPENDIX No. 7 (b) (ii).

Crop-cutting surveys by the random sampling method.

State—Madras. Year—1952-53. Crop—Paddy third period.

TABLE I.—Statement showing the estimated average yield sampling error and the total production.

Serial number and district.	Number of experiments.		Estimated average yield of rice in lb./acre.	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Production of rice in '000' tons estimated.
	Planned.	Considered for analysis.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 East Godavari ..	40	22	352.29	84.84	24.08	25
2 West Godavari ..	20	12	359.70	243.92	67.81	11
3 Bellary ..	12	6	991.73	552.42	55.70	3
4 Anantapur ..	20	16	1,500.88	217.92	14.52	25
5 Chittoor ..	20	18	1,268.48	259.96	20.49	25
6 Chingleput ..	24	12	1,033.60	330.22	31.94	37
7 North Arcot ..	20	17	918.78	196.85	21.42	25
8 South Arcot ..	16	12	1,028.95	118.72	11.53	26
9 Tiruchirappalli ..	12	7	1,508.38	195.89	12.98	18
10 Salem ..	8	8	1,776.58	96.69	5.44	11
11 Coimbatore ..	8	8	1,928.81	311.17	16.13	4
12 Malabar ..	8	6	542.28	201.04	37.07	2
For the districts covered by the survey	208	144	782.07	83.03	11.34	212
State ..	..	..	..	..	..	287

N.B.—No allowance has been made for the area occupied by bunds.

Crop-cutting surveys by the random sampling method.

State—Madras. Year—1952-53. Crop—Paddy third period.

TABLE II.—Frequency distribution of plot yields (dried, cleaned paddy).

Limits in lb./acre.	Number of plots.	Percentage on total.
(1)	(2)	(3)
0 < 100	13	9.02
100—200	5	3.47
200—300	8	5.55
300—400	4	2.78
400—500	3	2.08
500—600	3	2.08
600—700	6	4.17
700—800	5	3.47
800—900	1	0.69
900—1,000	6	4.17
1,000—1,100	4	2.78
1,100—1,200	8	5.55
1,200—1,300	6	4.17
1,300—1,400	2	1.39
1,400—1,500	4	2.78
1,500—1,600	1	0.69
1,600—1,700	7	4.86
1,700—1,800	3	2.08
1,800—1,900	5	3.47
1,900—2,000	4	2.78
2,000—2,100	4	2.78
2,100—2,200	7	4.86
2,200—2,300	3	2.08
2,300—2,400	3	2.08
2,400—2,500	3	2.08
2,500—2,600	3	2.08
2,600—2,700	2	1.39
2,700—2,800	3	2.08
2,800—2,900	1	0.69
2,900—3,000	1	0.69
3,000—3,100	..	..
3,100—3,200	2	1.39
3,200—3,300	2	1.39
3,300—3,400	4	2.78
3,400—3,500	..	..
3,500—3,600	2	1.39
3,600—3,700	1	0.69
3,700—3,800	..	..
3,800—3,900	..	..
3,900—4,000	..	..
4,000—4,100	..	..
4,100—4,200	..	..
4,200—4,300	1	0.69
4,300—4,400	..	..
4,400—4,500	..	..
4,500—4,600	2	1.39
4,600—4,700	..	..
4,700—4,800	2	0.69
4,800—4,900	..	..
4,900—5,000	..	..
5,000—5,100	..	..
5,100—5,200	..	..
5,200—5,300	..	..
5,300—5,400	1	0.69
Total ..	144	99.94

Mean in lb./acre 1,528.06 (Paddy).

Standard deviation 1,144.7 lb./acre.

Co-efficient of variation 74.9 per cent.

A.A.B.—12

Crop sampling surveys by the random sampling method in Madras State—1952-53.

TABLE III.—Crop—Paddy third period—Analysis of variance of plot yields (dried and cleaned produce), husked paddy (rice) expressed in 00 (lb./acre)².

District.	Between taluks.		Between villages.		Within villages.	
	Degrees of freedom.	Mean square in 00 (lb./acre) ² .	Degrees of freedom.	Mean square in 00 (lb./acre) ² .	Degrees of freedom.	Mean square in 00 (lb./acre) ² .
(1)	(2)	(3)	(4)	(5)	(6)	(7)
East Godavari	2	6,914	8	1,529	11	383
West Godavari	1	6,736	4	3,329	6	863
Bellary	..	..	2	18,103	3	420
Anantapur	3	33,360	4	7,046	8	1,777
Chittoor	2	29,951	6	10,769	9	1,348
Chingleput	1	136	4	11,625	6	286
North Arcot	3	1,008	5	5,897	8	1,665
South Arcot	2	6,990	3	231	6	1,376
Tiruchirappalli	1	19,465	2	2,230	3	5,511
Salem	1	2,363	2	431	4	674
Coimbatore	1	34,945	2	6,638	4	3,017
Malabar	..	..	2	777	3	2,422
State	28	17,471	44	5,704	71	1,396

Crop-cutting surveys by the random sampling method in Madras State—1952-53.

TABLE IV.—Crop—Paddy third period—Statement showing the number of villages required for estimating the average yield of crop at different percentages of sampling error.

Number of fields per village.	Percentage sampling error.	2	3	4	5	6	7	8	9
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	..	1,690	751	423	270	188	138	105	83
2	..	1,861	805	340	218	151	111	85	67
3	..	1,251	556	313	200	139	102	78	62
4	..	1,196	532	299	191	133	97	75	59
5	..	1,164	517	291	186	129	95	78	59
6	..	1,142	507	285	183	127	93	71	56

APPENDIX NO. 7 (c).

Crop sampling surveys by random sampling method in Madras State—1952-53.

TABLE I.—Irrigated ragi I crop—Average yield with their sampling errors and estimated production.

District.	Number of experiments.		Area (1951-52 figures) in '00' acres.	Estimated average yield in lb./acre (clean dry produce).	Sampling error of average yield in lb./acre.	Percentage standard error.	Total estimated production in '00' tons.
	Planned.	Conducted.					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Srikakulam ..	66	4	380	483.62	14.06	2.9	52
2 Visakhapatnam ..	34	Lost	..	..	..	..	..
3 Guntur ..	10	Lost	..	..	..	..	..
4 Bellary ..	10	Lost	..	..	..	..	..
5 Anantapur ..	94	40	504	757.75	135.75	17.9	171
6 Nellore ..	14	Lost	..	..	..	..	..
7 Chittoor ..	64	42	263	851.13	105.85	12.44	100
8 Chingleput ..	96	46	371	915.63	122.26	13.35	152
9 North Arcot ..	96	36	386	956.94	152.65	15.95	165
10 South Arcot ..	50	38	301	793.13	85.05	10.72	107
11 Tanjore ..	16	10	86	908.00	566.38	62.37	35
12 Tiruchirappalli ..	68	34	126	956.13	82.13	8.59	54
13 Madurai ..	80	62	391	990.88	88.06	8.89	173
14 Ramanathapuram ..	80	38	218	943.94	103.38	10.95	92
15 Tirunelveli ..	40	24	210	1,101.63	126.06	11.44	103
16 Coimbatore ..	110	44	376	1,247.00	173.75	13.92	209
State (For the districts covered by the survey).	934	418	3,612	930.32	42.38	4.35	1,443

N.B.—No allowance has been made for the area occupied by bunds.

Crop sampling surveys by the random sampling method in Madras State—1952-53.

TABLE II (a).—Irrigated ragi II crop—Average yields with their sampling errors and estimated production.

District.	Number of experiments.		Estimated area under the crop in '00' acres during 1952-53.	Estimated average yield in lbs./acre (clean dry produce).	Sampling error of average yield in lbs./acre.	Percentage standard error.	Total estimated production in '00' tons.
	Planned.	Considered for analysis.					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Srikakulam ..	54	28	103	754.06	109.56	14.53	35
Visakhapatnam ..	46	8	87	646.12	269.75	41.75	25
Kurnool ..	30	14	129	884.38	153.25	17.32	51
Anantapur ..	26	6	234	578.3	249.00	43.06	60
Cuddapah ..	100	36	525	1,023.63	138.25	13.50	240
Nellore ..	100	30	531	1,049.56	167.81	15.99	249
Chittoor ..	16	10	88	1,483.81	132.63	8.94	58
Chingleput ..	24	6	125	704.19	232.25	32.98	39
North Arcot ..	24	10	438	971.50	353.31	36.36	190
Salem ..	80	33	78	829.56	187.94	22.65	29
South Arcot ..	70	30	313	960.19	146.56	15.26	134
Coimbatore ..	10	6	66	683.31	169.13	24.75	20
For the Districts covered by the Survey	*580	217	2,717	909.38	54.78	6.02	1,130
State ..	600	217	3,221	909.38	54.78	6.02	1,335

* Of eight experiments planned in Guntur district only two were completed; but these were not considered for analysis. No experiment was completed in Tiruchirappalli district where 12 experiments had been planned. No allowance has been made for area occupied by bunds.

Crop-cutting experiments by random sampling method in Madras State—1952-53.

TABLE III.—Irrigated ragi II Crop.—Frequency distribution of plot yields (dried and cleaned produce.)

Limits in oz./plot.	Number of plots.	Percentage to total.
0-10	11	5.06
10-20	4	1.84
20-30	4	1.84
30-40	4	1.84
40-50	9	4.15
50-60	7	3.22
60-70	10	4.61
70-80	7	3.22
80-90	8	3.69
90-100	14	6.45
100-110	6	2.76
110-120	8	3.69
120-130	9	4.15
130-140	7	3.22
140-150	10	4.61
150-160	4	1.84
160-170	21	9.68
170-180	11	5.06
180-190	4	1.84
190-200	5	2.30
200-210	10	4.61
210-220	3	1.38
220-230	6	2.76
230-240	2	0.92
240-250	4	1.84
250-260	3	1.38
260-270	3	1.38
270-280	2	0.92
280-290	2	0.92
290-300	6	2.76
300-310	4	1.84
310-320	1	0.46
320-330	1	0.46
330-340	..	..
340-350	3	1.38
350-360	1	0.46
360-370	1	0.46
370-380	..	..
380-390	..	..
390-400	..	..
400-410	1	0.46
>410	1	0.46
Total	217	99.92

Mean in lb./acre 900.50.

Standard deviation 542.50.

Co-efficient of variation 60.24 per cent.

Crop-cutting surveys by the random sampling method in Madras State—1952-53.

TABLE IV.—Irrigated ragi II Period—Analysis of variance of plot yields in terms of '00's (lb./acre).

Serial number and District.	Between taluks.		Between villages.		Within villages.	
	D.F.	Mean square in '00 (lb./acre) ² .	D.F.	Mean square in '00 (lb./acre) ² .	D.F.	Mean square in '00 (lb./acre) ² .
1 Srikakulam	3	4,555	10	2,792	14	352
2 Vishakapatnam	1	33,651	2	5,667	4	55
3 Kurnool	..	..	6	3,288	7	820
4 Anantapur	..	..	2	3,720	3	91
5 Cuddapah	4	6,533	13	6,140	18	2,261
6 Nellore	2	15,847	12	5,892	15	653
7 Chittoor	1	15,160	3	1,689	5	1,369
8 Chingleput	..	..	2	3,236	3	849
9 North Arcot	1	95,056	3	11,743	5	887
10 Salem	5	4,411	11	7,149	16	1,840
11 South Arcot	1	8,537	10	4,884	15	1,273
12 Coimbatore	..	..	2	1,717	3	350
State	18	5,130	76	5,193	108	1,157

Crop-cutting surveys by the random sampling method in Madras State—1952-53.

TABLE V.—Irrigated ragi II Period—Statement showing the number of villages required for estimating the average yield of crop at different percentages of Sampling errors.

K/P.	2.	3.	4.	5.	6.	7.	8.	9.
1	963	428	241	154	107	79	60	47
2	788	351	197	126	88	64	49	39
3	729	324	183	117	81	60	46	36
4	700	311	175	112	78	57	44	34
5	683	304	171	109	76	56	43	34
6	671	298	168	107	75	55	42	33

K.—Number of fields per village.

P.—Percentage of sampling error.

APPENDIX No. 7 (c) (1).

Crop-cutting experiments by random sampling method in Madras State—1952-53.

TABLE I (b).—Unirrigated ragi—Average yield with their sampling error and estimated production.

District.	Number of experiments.		Area in '000 used for estimating production.	Average lb./acre.	Sampling Error.	Percentage standard error.	Estimated production in '000 tons.
	Planned.	Taken for analysis.					
Srikakulam	50	30	557	663.63	106.25	16.01	166
Vishakapatnam	70	46	751	589.81	140.06	23.74	199
Bellary	30	24	185	315.25	108.13	34.29	26
Anantapur	30	8	162	37.50	20.50	54.67	3
Chittoor	96	50	948	259.88	143.69	55.29	111
Chingleput	40	10	304	444.56	397.19	89.34	60
North Arcot	24	lost	..	..	..	..	..
Salem	140	44	2269	467.38	49.13	10.51	477
South Arcot	24	lost	..	..	..	..	..
Tiruchirappalli	40	22	290	275.31	77.88	27.11	36
Madurai	18	4	63	292.19	126.44	43.27	8
Ramanathapuram.	48	18	266	365.13	37.75	10.34	44
Coimbatore	90	14	768	620.38	96.63	15.58	198
State—for the districts covered by the survey.	700	300	6503	460.81	39.63	8.55	1328
State as a whole.	..	..	7519	460.81	..	..	1537

Crop cutting surveys by random sampling Method in Madras—1952-53.

TABLE II.—Unirrigated Ragi—Frequency distribution of plots yield with mean and Standard deviation.

Limits in oz. per plot.	Number of plots.	Percentage to the total.
0—10	23	7.69
10—20	36	11.98
20—30	32	10.56
30—40	23	7.59
40—50	29	9.57
50—60	16	5.28
60—70	20	6.60
70—80	13	4.29
80—90	19	6.27
90—100	20	6.20
100—110	9	3.00
110—120	14	4.62
120—130	9	3.00
130—140	4	1.32
140—150	7	2.31
150—160	3	1.00
160—170	4	1.32
170—180	Nil.	Nil.
180—190	1	0.33
190—200	3	1.00
200—210	1	0.33
210—220	1	0.33
220—230	2	0.66
230—240	1	0.33
240—250	2	0.66
250—260	Nil.	Nil.
260—270	Nil.	Nil.
270—280	2	0.66
280—290	Nil.	Nil.
290—300	1	0.33
300—310	Nil.	Nil.
310—320	1	0.33
320—330	Nil.	Nil.
330—340	1	0.33
340—350	Nil.	Nil.
350—360	Nil.	Nil.
360—370	1	0.33
—370	2	0.66
Total	300	99.28

Arithmetic Mean : 71.9 oz. per plot

Standard Deviation 65.4 oz. per plot

i.e. Arithmetic Mean : 449.38 lb. per acre.

Standard Deviation : 408.75 lb. per acre and co-efficient of variation : 90.1 percent.

Crop-cutting surveys by random sampling method in Madras—1952-53.

TABLE III.—Unirrigated Ragi—Analysis of variance of plot yields ('00' lb./acre)²

District.	Taluk mean square.	D.F.	Mean square between villages.	D.F.	Mean square within villages.	D.F.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Srikakulam	7,138	3	3,290	11	92	15
Visakhapatnam	17,020	3	5,829	19	1,476	23
Bellary	165	1	1,260	10	1,173	12
Anantapur	Only one taluk.	..	34	3	098	4
Chittoor	724	2	1,000	22	628	25
Chingleput	7,467	1	12,770	3	553	5
Salem	4,134	3	880	18	163	22
Tiruchirappally	1,547	3	1,404	7	147	11
Madurai	Only one taluk.	..	641	1	229	2
Ramanathapuram	994	2	103	6	202	9
Coimbatore	16,216	1	2,391	20	1,137	22
State	6,874	29	2,456	120	700	150

Crop-cutting surveys by random sampling method in Madras—1952-53.

TABLE IV.—Unirrigated Ragi—Statement showing the number of villages required for estimating the average yield of crop at different percentages of sampling error.

K.	P.	2	3	4	5	6	7	8	9	10
1	..	1,880	835	470	301	209	153	117	93	75
2	..	1,468	652	367	235	163	120	92	72	59
3	..	1,331	591	333	213	148	109	83	66	53
4	..	1,262	561	316	202	140	103	79	62	50
5	..	1,221	543	305	195	136	100	76	60	49
6	..	1,193	530	298	191	133	97	75	59	48

K.—Number of fields per village required for estimating the average yields of crops at different percentages of Sampling Error.
P.—Different percentages of Sampling Error.

APPENDIX No. 7 (c) (1).

Crop-cutting experiments by random sampling method in Madras—1952-53.

TABLE I (c).—Unirrigated Cholan—Revised estimation of production with regard to 1952-53 area figures.

District.	1952-53 Area figures in '00'	Average yield in lb./acre.	Production estimate in '00' tons.
(1)	(2)	(3)	(4)
Visakhapatnam	400	288.13	51
East Godavari	770	484.69	167
West Godavari	480	334.06	72
Krishna	2,220	593.00	588
Guntur	4,500	390.88	785
Kurnool	5,950	540.50	1,436
Bellary	7,000	228.19	713
Anantapur	3,328	119.06	177
Cuddapah	2,910	192.25	250
Nellore	3,713	362.76	601
Chittoor	375	442.44	74
North Arcot	880	374.69	147
Salem	2,141	423.75	405
South Arcot	1,408	193.56	122
Tiruchirappalli	2,290	197.56	202
Madurai	2,049	420.11	384
Coimbatore	4,135	220.56	407
State (for the districts covered by the survey)	44,549	324.31	6,581
State as a whole	45,200	324.31	6,675

APPENDIX No. 7 (d).

Crop-cutting surveys by random sampling method in Madras—1952-53.

Irrigated cumbu.—Average yield with their sampling error and the estimated yield.

District.	Number of experiments.		Area in '00'.	Average yield lb./acre.	Sampling error lb./acre.	Percentage standard error.	Estimated yield in '00' tons.
	Planned.	Taken for analysis.					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Kurnool ..	20	12	108	918.1	228.8	24.9	44
2 Cuddapah ..	52	24	272	964.4	127.5	13.2	117
3 Nellore ..	90	36	603	1,365.6	129.4	9.5	368
4 Chittoor ..	44	18	144	928.8	95.0	10.2	60
5 North Arcot ..	52	4	120	753.8	322.5	42.8	40
6 Salem ..	80	28	250	686.3	153.8	22.4	77
7 South Arcot ..	22	6	65	592.5	82.5	13.9	17
8 Tiruchirappalli ..	64	42	306	541.9	159.4	29.4	74
9 Madurai ..	26	18	97	470.0	106.9	22.7	20
10 Ramanathapuram.	36	6	299	1,068.8	196.3	18.4	143
11 Tirunelveli ..	6	4	30	1,217.5	546.3	44.9	16
12 Coimbatore ..	100	48	510	761.9	70.0	9.2	174
State (for the districts covered by the survey).	608	246	2,804	915.6	42.5	4.6	1,150

N.B.—No allowance has been made for the bunds occupied.

APPENDIX No. 7 (e).

Crop sampling surveys by random sampling method in Madras State—1952-53.

Unirrigated cumbu.—Average yield with their sampling errors and estimated production.

District.	Number of experiments.		Average yield in lb/acre (dry cleaned produce).	Sampling error in lb./acre.	Percentage sampling error.	Estimated production in '00' of tons.
	Planned.	Conducted and taken for analysis.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Srikakulam ..	24	10	506.00	107.00	21.14	34
2 Visakhapatnam ..	112	78	640.31	51.38	8.02	472
3 East Godavari ..	36	18	369.38	96.00	25.98	73
4 Guntur ..	120	36	241.31	59.75	24.76	163
5 Kurnool ..	40	16	328.81	93.75	28.51	74
6 Bellary ..	100	38	195.44	30.88	15.80	100
7 Anantapur ..	120	40	161.50	26.69	16.53	121
8 Cuddappah ..	60	4	448.44	238.25	53.12	186
9 Nellore ..	28	4	104.69	63.53	60.68	26
10 Chittoor ..	92	66	302.94	47.51	15.62	200
11 North Arcot ..	48	4	214.06	161.06	75.24	48
12 Salem ..	120	40	371.75	67.25	18.09	282
13 South Arcot ..	64	30	209.63	50.06	23.88	105
14 Tiruchirappalli ..	120	48	358.13	46.06	12.86	306
15 Madurai ..	28	20	393.63	140.75	36.69	69
16 Ramanathapuram.	72	52	292.25	92.25	31.57	138
17 Tirunelveli ..	100	20	250.50	127.88	51.05	176
18 Coimbatore ..	140	34	186.13	34.13	18.40	194
State (for the districts covered by the survey).	1,424	556	308.13	18.94	6.16	2,767

N.B.—No allowance has been made for the area occupied by the bunds.

APPENDIX No. 7 (f)

Results of analysis of Grow More Food Aid experiments conducted during 1952-53.

Category.	I period (1952-53).				II period (1952-53).			
	Number of experiments planned.	Number of experiments conducted.	Additional production of rice in lb./acre.	Percentage standard error.	Number of experiments planned.	Number of experiments conducted.	Additional production of rice in lb./acre.	Percentage standard error.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Improved seed ..	23	21	144	4.7	126	107	171	23.9
Green manure ..	13	11	207	3.9	81	71	257	14.2
Ammonium sulphate ..	44	37	288	3.4	203	172	291	11.6

APPENDIX No. 7 (g).

Statement showing the figures of acreage and yield of food crops in Madras in 1952-1953.

Madras in 1952-1953.

	Crop.	Area.	Yield.	Remarks.
	(1)	(2)	(3)	(4)
Cereals—				
		ACS.	TONS.	
Paddy		9,993,000	6,019,000	Yield in terms of unhusked grain.
Cholam		4,939,600	1,041,100	
Cumbu		2,382,000	474,900	
Ragi		1,506,000	577,400	
Korra		1,576,900	195,100	
Varagu		922,400	274,400	
Samai		545,200	79,800	
Maize		38,400	15,900	
Others		605,120	98,780	
Total, Cereals	..	22,508,620	8,776,380	
Pulses—				
Greengram		470,000	40,800	
Redgram		387,000	45,000	
Blackgram		288,300	32,400	
Bengalgram		94,100	15,600	
Horsegram		1,340,500	94,100	
Others		261,100	17,300	
Total, Pulses	..	2,841,000	245,200	

Statement showing the figures of acreage and yield of food crops
in Madras, 1953—cont.

Crop.	Area.	Yield.	Remarks.
(1)	ACS.	TONS	(4)
Condiments and Spices—			
Chillies	361,900	145,100	in terms of dry chillies.
Ginger	13,950	4,720	in terms of dry ginger.
Pepper	114,900	8,300	
Others	393,290	183,930	
Total ..	884,040	382,050	
Sugars—			
Sugarcane	263,100	700,040	in terms of gur.
Others	83,060	65,460	
Total, Sugars ..	346,160	765,500	
Fruits and vegetables including root crops—			
Mangoes	263,000	753,860	
Plantains	160,270	1,124,000	
Onions	46,000	186,500	
Others	434,350	1,451,640	
Total ..	903,620	3,516,000	
Miscellaneous—			
Food crops	47,510	13,510	
Total, food crops ..	27,530,950	13,658,640	

NOTE.—(a) The figures of area and yield in respect of paddy, cholam, cumbu, ragi, korra, varagu, samai, maize, greengram, redgram, blackgram, bengalgram, horsegram, sugarcane, chillies, ginger, pepper and onions are according to the final forecast reports for 1953-53. Information in respect of other crops is based on rough estimates.

(b) The figures of yield of cereals and pulses are in terms of unhusked grain. The estimated loss of weight in husking is 33 per cent for paddy, 15 per cent for cholam, 20 per cent for cumbu and korra, 10 per cent for ragi, 40 per cent for varagu and maize, 45 per cent for samai and 20 per cent for other cereals and pulses.

(c) Figures for "condiments and spices" have also been furnished, as Government of India have since classified the group under 'food crops'. Condiments and spices were classified under food crops in the Season and Crop Report for 1951-52.

APPENDIX No. 8.

Area estimated under improved strains of crops 1952-53.

Name of Officer.	Name of crop.	Estimated area covered by improved strains during 1952-53.	Total area under the crop.	Percentage of improved strains.
(1)	(2)	(3)	(4)	(5)
		MILLION ACS.	MILLION ACS.	PER CENT.
Paddy Specialist, Coimbatore ..	Paddy ..	6.4	10.8	60
		LAKHS.	LAKHS.	
Millet Specialist, Coimbatore ..	Cholam ..	6.2	45.3	13.7
	Cumbu ..	0.65	22.9	2.9
	Ragi ..	0.81	15.1	5.4
	Tenai ..	3.22	15.4	0.9
	Total ..		98.7	11.1 average.
Cotton Specialist, Coimbatore ..	Cotton ..	10.53		58.5
Oilseeds Specialist, Coimbatore ..	Groundnut ..	3.95	43.48	9.1
Sugarcane Specialist, Anakapalle.	Awaited.			

APPENDIX No. 9.

Financial aid to farmers.

Statement showing the amounts of loan disbursed under different categories during 1952-53 to the ryots in the different districts of the State.

Serial number and name of district.	Amount disbursed.		
	Seeds and manures.	Implements.	Intensive Manuring Scheme—Chemical fertilizers.
(1)	(2)	(3)	(4)
	RS.	RS.	RS.
1 Srikakulam	60,000	230	90,675
2 Anakapalle (Visakhapatnam) ..	1,00,050	1,000	1,94,720
3 East Godavari	40,330	400	8,21,890
4 West Godavari	87,970	585	8,15,640
5 Krishna	92,350	540	14,53,865
6 Guntur	1,24,310		6,70,540
7 Kurnool	26,860		28,270
8 Nellore	78,870	200	6,37,540
9 Cuddappah	2,95,100	420	1,39,770
10 Anantapur	2,98,530	3,000	
11 Bellary	64,640	1,500	75,390
12 Chittoor	1,80,175	3,945	48,640
13 Chingleput	2,18,950	1,550	1,98,490
14 North Arcot	1,39,310	1,310	56,540
15 South Arcot	1,41,850	1,000	2,40,590
16 Tanjore	1,19,835	555	5,50,125
17 Pudukottai	2,13,030	390	4,50,010

Statement showing the amounts of loan disbursed under different categories during 1952-53 to the ryots in the different districts of the State—cont.

Serial number and name of district.	Amount disbursed.		
	Seeds and manures.	Implements.	Intensive Manuring Scheme—Chemical fertilizers.
	(2)	(3)	(4)
(1)	Rs.	Rs.	Rs.
18 Tiruchirappalli	1,21,610	1,980	3,15,000
19 Madurai	1,10,230	590	5,17,010
20 Ramanathapuram	2,30,830	2,290	26,850
21 Tirunelveli	8,710	1,610	3,47,280
22 Coimbatore	74,410	1,660	56,270
23 Salem	74,222	1,900	29,020
24 Nilgiris	1,18,500	1,000	..
25 Tellicherry (North Malabar) ..	94,850	180	2,860
26 South Malabar	65,500	..	..
27 Mangalore	41,360	350	29,565
Total ..	31,82,382	28,185	77,96,550

Seeds and manures.—Loans under this category were issued to the ryots free of interest up to the end of 1952-53. From the current financial year interest is charged at the rate of 5½ per cent on these loans—vide G.O. No. 1119, Finance, dated 10th August 1953.

Implements.—As per G.O. No. 796, Finance, dated 26th June 1952, interest was charged at the rate of 5 per cent on the loans for the purchase of agricultural implements during 1952-53. In G.O. No. 1119, Finance, dated 10th August 1953, this rate has been increased to 5½ per cent.

Intensive manuring scheme.—This scheme, during the year 1952-53, was sanctioned in G.O. No. 215, Food and Agriculture (Food Production), dated 6th June 1952, interest at the rate of 4½ per cent was charged on the loans under this scheme as per Government, Food and Agriculture (Food Production), Memorandum No. 13972, dated 9th July 1952. The scheme closed on 30th November 1952.

APPENDIX No. 10.

Pipes supplied to the ryots for electric motors and oil engine during 1952-53.

Serial number.	Month and year.	Number of electric motors to which pipes were supplied.	Number of oil engine to which pipes were supplied.	Total quantity of pipes supplied to electric motors and oil engines.
(1)	(2)	(3)	(4)	(5)
1952—				
1 July		77	113	10,231
2 August		87	78	9,577
3 September		81	117	8,172
4 October		57	116	11,788
5 November		63	113	11,912
6 December		44	191	15,550
1953—				
7 January		35	50	8,142
8 February		71	59	9,803
9 March		22	31	4,726
10 April		7	24	2,660
11 May		7	15	1,797
12 June		10	20	1,853
		561	927	96,211

APPENDIX No. 11 (a).

Statement showing the distribution of tractors and bull-dozers.

Serial number and name of district.	With bull-dozers.	Without bull-dozers.	Total.
	(2)	(3)	(4)
1 Srikakulam	5	3	8
2 Visakhapatnam	8	3	11
3 Araku valley	..	1	1
4 East Godavari	7	6	13
5 West Godavari	5	5	10
6 Krishna	4	3	7
7 Guntur	8	9	17
8 Nellore	8	7	15
9 Kurnool	5	3	8
10 Anantapur	6	3	9
11 Bellary	11	9	20
12 Pilot Scheme, Bellary	8	3	11
13 Cuddapah	2	4	6
14 Chittoor	3	5	8
15 Chingleput	10	9	19
16 North Arcot	4	3	7
17 South Arcot	8	7	15
18 Tanjore	4	10	14
19 Tiruchirappalli	6	7	13
20 Madurai	8	5	13
21 Ramanathapuram	4	6	10
22 Tirunelveli	4	6	10
23 Salem	7	2	9
24 Coimbatore	12	12	24
25 Nilgiris	1	..	1
26 North Malabar	4	3	7
27 South Malabar	5	2	7
28 South Kanara	8	1	9
Total ..	165	137	302

APPENDIX No. 11 (b).

Particulars of types of tractors and their H.P. held by the Department.

Name and type of tractor.	H.P.	Total number of tractors.	
	(2)	With bull-dozers.	Without bull-dozers.
(1)	(2)	(3)	(4)
<i>Small type—</i>			
10/20 Mc Cormic Deering	20	..	2
Mc Cormic Deering W. 4	25	..	2
Massey Harris 30 K	22	..	20
Massey Harris 20 K	18.5	..	19
<i>Medium type—</i>			
L.H.C. W.D. 9	40	..	13
Do. T.D. 9	40	9	2
Do. W.6	30	21	30
Do. T.6	30	..	1
Fordson Major	30	..	3
John Deere AW. and AR.	40	..	23
L.H. Case	40	..	1
L.H.C. T.D. 6 tractor	34	6	8
Caterpillar D. 4	45	32	..
David Brown	25	..	13
<i>Heavy type—</i>			
Caterpillar D. 6	65	58	..
Do. D. 7	75	12	..
L.H.C. T.D. 14	65	27	..
Total ..	..	165	137
		302	

Note.—Out of this 31 units have been acquired from the Army Surplus during 1946 in reconditioned stage and they have fully completed of their life.

APPENDIX No. 11 (c).

Details showing types and models of tractors with the Agricultural Department

Year.	I.H.C. consisting of T.D. 9. W.D. 9. W. 4. 10/20 T.D. 14, W. 6.	John Deere consisting of A-E. A-W. and A Model.	Cater- pillar D. 6. D. 7. D. 4.	L.H. Case.	Massey Harris consisting of 30 K and 20 K.	Fordson Major.	David Brown.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1945-46	4	1	..	1	..	..	..	6
1946-47	12	1	31	1	..	..	..	45
1947-48	64	1	31	1	40	3	..	140
1948-49	64	13	31	1	40	3	..	152
1949-50	114	22	58	..	40	3	..	233
1950-51	114	23	87	..	40	3	..	268
1951-52	121	23	92	1	40	3	13	293
1952-53	121	23	101	1	40	3	13	302
Numbers attach- ed with bull- dozers.	64	..	101	..	..	..	..	165

APPENDIX No. 12.

Statement showing the districtwise outturn of the departmental tractors and bull-dozers for 1952-53.

Serial number and name of district.	Total number of hours bull- dozers worked from 1st July 1952 to 30th June 1953.	Total outturn (ploughing, levelling and harrowing from 1st July 1952 to 30th June 1953)
	HOURS.	ACS.
1 Srikakulam	3,556	588
2 Visakhapatnam	6,063	799
3 East Godavari	5,890	1,126
4 West Godavari	8,681	2,301
5 Krishna	2,750	1,430
6 Guntur	5,762	3,489
7 Nellore	6,521	1,396
8 Kurnool	1,388	1,294
9 Anantapur	4,450	1,299
10 Bellary	8,131	6,838
11 Cuddapah	2,206	1,561
12 Chittoor	6,220	1,125
13 North Arcot	4,840	1,080
14 Chingleput	11,290	2,622
15 South Arcot	2,630	2,971
16 Tanjore	1,984	4,474
17 Tiruchirappalli	5,240	1,758
18 Madurai	8,037	1,832
19 Tirunelveli	2,353	1,985
20 Ramanathapuram	3,374	4,242
21 Salem	9,686	1,074
22 Coimbatore	16,504	6,530
23 The Nilgiris	743	110
24 North Malabar	2,707	1,312
25 South Malabar	5,945	410
26 South Kanara	6,878	282
27 Araku valley	..	388
28 Pilot Scheme, Bellary	..	35
Total	138,829	52,291

APPENDIX No. 13.

Statement showing the progressive increase on the hire charges on tractors and bull-dozers.

Details.	Rates of hire charges including transport charges which should be borne by the ryots from 1st April 1946 to 30th June 1950.	Rates of hire charges excluding transport charges which should be borne by the ryots from 1st July 1950 to 31st March 1953.	Rates of hire charges including transport charges from 1st April 1952.
(1)	(2)	(3)	(4)
	RS.	RS.	RS.
	(PER ACRE.)	(PER ACRE.)	(PER ACRE.)
Ploughing (by all types of tractors)	5 0 0	10 0 0	12 0 0
Ploughing (shallow ploughing)	3 0 0	5 0 0	7 0 0
	RS.	RS.	RS.
	(PER HOUR.)	(PER HOUR.)	(PER HOUR.)
Levelling with bull-dozers D. 7	9 0 0	12 0 0	14 0 0
Do. D. 6	7 0 0	10 0 0	12 0 0
Do. T.D. 14	7 0 0	10 0 0	12 0 0
Do. T.D. 9	7 0 0	8 0 0	10 0 0
Do. T.D. 6	7 0 0	8 0 0	10 0 0
Do. T. 6	7 0 0	8 0 0	10 0 0
Do. D. 4	5 0 0	8 0 0	10 0 0

APPENDIX No. 14.

Statement showing Acreage tackled by departmental tractors from 1946-47 to 1952-53.

	1946-47.	1947-48.	1948-49.	1949-50.	1950-51.	1951-52.	1952-53.
Target in acres	..	10,000	43,000	40,000	80,000	1,00,000	80,000
Outturn in acres	4,360	10,025	35,569	58,315	66,720	51,983	52,291
Number of hours worked by bull-dozers.	11,011	15,525	19,375	38,236	55,344	13,132	138,829
Additional foodgrains in tons.	1,090	2,500	8,892	8,213	7,281	5,487	6,294
Number of tractors with and without bull-dozers.	45	140	152	233	268	293	302
Number of bull-dozers.	27	27	42	90	136	164	165

APPENDIX No. 15.

Statement showing the tractors and implements available with the department from 1945-46 to 1952-53.

Particulars.	1945-46.	1946-47.	1947-48.	1948-49.	1949-50.	1950-51.	1951-52.	1952-53.
Tractors	6	45	140	152	233	268	293	302
Bull-dozers	..	27	27	42	60	136	154	164
Mould Board ploughs.	..	25	40	52	105	180	184	184
Disc harrows and cultivators.	1	20	33	41	96	96	97	97
Disc ploughs	7	33	47	193	287	351	355	355
Rotavators	..	..	..	..	..	..	9	9

APPENDIX No. 16.

Machinery purchased during the year under report.

Description.	Number received.	Name of the firm.	G.O. number and date.
(1)	(2)	(3)	(4)
1 D-8 tractor with bulldozers.	3	Messrs. Larsen & Toubro Ltd., Madras.	G.O. Ms. No. 529, Food and Agriculture (Food Production), dated 30th November 1951.
2 Number 24, Cable control for D-7 tractor.	1	Do.	G.O. Ms. No. 227, Food and Agriculture (Food Production), dated 24th November 1950.
3 Birtley No. 6-A B D with Caterpillar No. 46, Hydraulic control.	1	Do.	G.O. Ms. No. 271, Food and Agriculture (Food Production), dated 14th July 1952.
4 Fleco Rootrake and detachable stumper attachment.	1	Do.	G.O. Ms. No. 163, Food and Agriculture (Food Production), dated 18th April 1952.
5 One and half-ton chain-puller belonging to Mechanics tool-kit.	0	Messrs. Volkart Bros., Madras.	G.O. Ms. No. 228, Food and Agriculture (Food Production), dated 24th November 1950.

Machine purchased and supplied under Hire-Purchase System.

6 John Deere M. tractor ..	7	Messrs. Larsen & Toubro, Limited, Madras,	G.O. Ms. No. 255, Food and Agriculture (Food Production), dated 11th June 1953.
7 Steyr tractor	4	Jayems Engineering Company, Madras.	Do.
8 David Brown Kerosene tractor.	2	Messrs. Larsen & Toubro, Ltd., Madras.	Do.
9 Ferguson tractor ..	3	Kamani Engineering Corporation, Limited, Madras.	Do.
10 Formal H. tractor ..	2	Messrs. Volkart Bros., Madras.	Do.
11 Formal M. tractor ..	1	Do.	Do.
12 W-6 tractor	1	Do.	Do.
13 Zetor tractor	4	J. N. Marshal and Company, Bombay.	Do.
14 Mh. 22K tractor and 30K tractor.	3	Rallis' India, Limited, Madras.	Do.
15 Mh. 744-D tractor ..	1	Do.	Do.
Total ..	28		

APPENDIX No. 17.

Statement showing the jurisdiction of the Assistant Agricultural Engineers.

Name of each Assistant Agricultural Engineer with Headquarters.	Name of the district in his jurisdiction.
1 Assistant Agricultural Engineer (Inspection), Anakapalle.	Srikakulam, Visakhapatnam, East Godavari and Araku Valley.
2 Assistant Agricultural Engineer (Inspection), Vijayavada.	West Godavari and Krishna.
3 Assistant Agricultural Engineer (Inspection), Vellore.	Chittoor, Salem and North Arcot.
4 Assistant Agricultural Engineer (Inspection), Tiruchirappalli.	South Arcot, Tanjore and Tiruchirappalli.
5 Assistant Agricultural Engineer (Inspection), Madurai.	Madurai, Ramanathapuram and Tirunelveli.
6 Assistant Agricultural Engineer (Inspection), Bellary.	Bellary, Cuddapah, Kurnool and Anantapur.
7 Assistant Agricultural Engineer (Tractor Workshop), Bapatla.	Guntur and Nellore.
8 Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	Coimbatore and Nilgiris.
9 Gazetted Assistant to the Assistant Agricultural Engineer (Research), Coimbatore.	North Malabar, South Malabar and South Kanara.
10 Assistant Agricultural Engineer, Saidapet, Chingleput.	Chingleput.

Statement of expenditure and receipts of Agricultural Research Stations.

Serial number and name of Agricultural Research Station.	1951-52 (Pash).		1952-53 (Pash).		Remarks.
	(1)	(2)	(3)	(4)	(5)
		Rs.	Rs.	Rs.	Rs.
1 Agricultural Research Station, Aduturai	..	20,091	33,139	22,737	57,283
2 Banana Research Station, Aduturai	..	11,974	9,278	9,908	10,511
3 Rice Research Station, Buchchreddipalem	..	8,922	1,667	10,648	3,714
4 Pomological Station, Coonoor	..	9,204	5,780	10,312	6,103
5 Sims Park, Coonoor	..	7,643	5,066	8,636	6,691
6 Central Farm, Coimbatore	..	57,703	25,722	59,001	36,673
7 Agricultural Research Station, Hagari	..	17,317	13,532	24,257	26,982
8 Fruits Research Station, Kallar	..	14,274	7,359	14,132	17,809
9 Do. Buzilar	..	6,320	3,816	4,706	4,527
10 Do. Kodur	..	22,543	19,631	24,647	41,955
10-A Agricultural Research Station, Kollipatti	..	21,191	13,289	22,234	11,937
11 Do. Lam	..	33,807	3,604	22,408	6,664
12 Paddy Breeding Station, Mangalore	..	16,196	7,832	18,740	11,895
13 Agricultural Research Station, Maruturi	..	31,553	19,975	28,663	35,699
14 Do. Nandyal	..	11,571	7,161	12,232	7,825
15 Do. Nanjanad	..	36,083	24,837	28,005	29,336
16 Do. Nilaswar I, II and III.	..	32,637	14,206	24,937	16,976
17 Government Botanic Gardens, Ootacamund	..	22,472	8,364	18,838	7,175
18 Agricultural Research Station, Palur	..	25,542	13,338	26,203	19,265
19 Do. Pattambi	..	44,677	30,375	38,774	31,859
20 Do. Pattukottai	..	12,554	17,624	12,467	10,120
21 Deep Water, Rice Station, Pula	..	14,446	8,366	6,244	5,901
22 Agricultural Research Station, Samalkota	..	31,204	18,806	21,837	22,341
23 Do. Shraguppa	..	16,061	12,070	21,337	25,120
24 Do. Talparamba	..	39,560	21,418	29,577	16,808
25 Do. Thidivanam	..	36,675	21,529	33,054	26,331
26 Rice Research Station, Thirukuppam	..	20,926	7,136	20,803	8,537
27 College Farm, Bapatla	..	40,964	38,388	47,172	68,525
28 Sugarcane Research Station, Annapalle	..	87,391	37,457	77,459	45,910
29 Agricultural Research Station, Gudiyattam	..	17,405	11,056	14,867	9,432
30 Do. Satiyanagalam	..	8,480	1,233	4,332	1,312
31 Panagal Farm, Kalahasti	..	5,216	4,481	5,603	8,565
32 Rice Research Station, Ambamundram	..	13,523	6,313	13,189	15,926

APPENDICES

APPENDICES

APPENDIX No. 19.

List of Agricultural Schemes in progress in Madras State during 1952-53.

(a) Scheme financed by the Indian Council of Agricultural Research.

Number and name of the scheme.	Place of working.	Officer-in-charge.	Object of the scheme.
1 Citrus Root stock trials.	Kodur (Cuddapah district).	Superintendent, Fruit Research Station, Kodur.	To find out suitable types of citrus root stocks.
2 Banana Scheme ..	Aduthurai (Tanjore district).	Banana Research Officer.	For research work on bananas of the State classification, breeding and improvement work.
3 Scheme for scientific aid to the Pepper industry.	Panniyur (Malabar district).	Pepper Specialist ..	For improvement work on pepper by selection and hybridization and to investigate into the causes of 'Pollu' diseases.
4 Scheme for the improvement of hill fruits.	Nilgiris ..	Assistant Fruit Specialist, Coonoor.	To carry out improvements in hill fruits of the Nilgiris.
5 Scheme for scientific aid to cardamom industry in South India.	Singampatti (Tirunelveli).	Cardamom Specialist.	To produce better types of cardamom by breeding and to devise control measures for cardamom pests.
6 Scheme for research in Ginger cultivation.	Malabar ..	Paddy Specialist ..	For research in varietal, manurial, cultural, preservation and cure, of diseases of ginger.
7 Scheme for the multiplication and distribution of Hybrid cumbu strains.	Coimbatore district and Kolipatti	Millet Specialist ..	To evolve and multiply on a large scale cumbu hybrid strains which have hybrid vigour.
8 Scheme for research in control of striga in Cholam.	Guntur, Nandyal, Coimbatore and Hagari.	Do.	To find out suitable effective measures for the control of striga on sorghum and build up homozygous strain of sorghum resistant of strig attack.
9 Scheme for the improvement of pulses.	Coimbatore, Salem and Visakhapatnam.	Pulses Specialist, Coimbatore.	To evolve a high yielding types resistant to disease and having bold grain attractive colour and good cooking quality. Redgram, Bengalgram, greengram, blackgram, cowpeas-lab-lab are tackled.
10 Scheme for investigation of blast and foot-rot diseases of rice.	Coimbatore ..	Assistant Mycologist, Coimbatore.	To control blast and foot-rot by resistant varieties and use of fungicides.
11 Scheme for co-ordinated crop weather studies in Madras State.	Selected Agricultural Research Stations in Madras State.	Agricultural Meteorologist, Coimbatore.	To study the relationship between weather and crop growth, occurrence of pest and diseases, etc.
12 Scheme for varietal and agronomic trials to determine optimum yield.	Tanjore ..	Assistant Agricultural Chemist, Tanjore.	To conduct simple manurial experiments and soil survey.
13 Scheme for investigation of possibilities of pre-soaking seeds in nutrient salt solutions.	Coimbatore ..	Plant Physiologist, Coimbatore.	To investigate the possibilities of pre-soaking seeds in nutrient solutions for improving crop yields.
14 Scheme for research on cashewnuts.	South Kanara ..	Assistant Fruit Specialist, Mangalore.	To undertake research in cashewnut in the State varieties, cultivation method, etc.
15 Scheme for Regional Bee Research Station in Madras State.	Coimbatore ..	Government Entomologist.	To investigate the possibilities of improving the Indian Honey Bee.
16 Scheme for crop cutting experiments on paddy, millets, oil seeds and for statistical assessment of the results due to Grow More Food aids.	Madras State ..	Deputy Director, of Agriculture (Crop Sampling, Madras).	To work out the normal yields of food crops, paddy, millets, oil seeds etc., and to assess the effect of the Grow More Food aids on production in the State.
17 Scheme for improvement of sweet potato and tapioca.	Mangalore, Coimbatore, Raptia of Madras State.	Paddy Specialist ..	For improvement work in sweet potato and tapioca by breeding and manuring evolution of strains resistant to soils and diseases, etc.
18 Scheme for the improvement of chillies.	Lam, Guntur district.	Chillies Specialist ..	To evolve thrip resistant and high yielding strains of chillies.
19 Scheme for research on eradication of Weeds by herbicidal chemicals.	Coimbatore ..	Plant Physiologist, Coimbatore.	Control and eradication of the most important weeds infesting food crops.

List of Agricultural Schemes in progress in Madras State during 1952-53—cont.

Number and name of the scheme. Place of working. Officer-in-charge. Object of the scheme.

(b) Schemes financed by the Indian Central Cotton Committee.

1 Scheme for the improvement of Mungari cotton in Madras State.	Adoni (Bellary district).	Assistant Cotton Specialist, Bellary.	For evolving a strain from Mungari cottons having the quality of Westerns suitable for red and black soils.
2 Scheme for improvement of Kakinada cotton.	Narasaraopet (Guntur district).	Assistant Cotton Specialist, Narasaraopet.	Evolution of an improved strain with reddish brown lint, medium staple and fair ginning percentage of 30 per cent good fibre strength and higher yield.
3 Scheme for multiplication and distribution of C.I. and 836 B. Cotton in Guntur district.	Guntur district ..	District Agricultural Officer, Guntur.	To multiply and distribute pure seeds of C.I. and 836 B Cotton.
4 Scheme for breeding of long staple cotton, Madras.	Palur and Srivilliputtur (Ramanathapuram district).	Assistant Cotton Specialist, Srivilliputtur.	To evolve a long staple cotton suitable for cultivation in the State.
5 Scheme for breeding Cambodia cotton in Ceded districts.	Siruguppa, Hagari and Nandyal.	Assistant Cotton Specialist, Siruguppa.	To explore the possibilities of replacing local types by suitable American cotton to suit black soil of the region under irrigation.
6 Scheme for improvement of Tinnies and Karunganni cotton.	Kolipatti ..	Assistant Cotton Specialist, Kolipatti.	To evolve a cosmopolitan Karunganni type with high ginning percentage and staple length.
7 Scheme for improvement of Westerns cotton.	Hagari ..	Assistant Cotton Specialist, Mungari Scheme is in-charge of this also.	Evolution of better type of Westerns cotton than the present Westerns.
8 Scheme for the breeding of long staple American Cotton as Winter crop for Central districts and Sea Island cotton for West Coast.	Tiruchengode, Avannashi, Srivilliputtur, Nilleshwar, Pattambi, and Coimbatore.	Assistant Cotton Specialist, Winter Cambodia Scheme, Coimbatore.	To evolve a long staple American type suitable for cultivation as a Winter crop in Central districts and conducting trials of Sea Island cotton in the West Coast.
9 Scheme for improvement of White Northern cotton.	Nandyal ..	Assistant Cotton Specialist, Nandyal.	To supply pure seeds to cotton growers and to increase the staple length and spinning value of Northern.
10 Scheme for the breeding of unirrigated Cambodia cotton in Periakulam.	Periakulam, Madurai district.	Assistant Cotton Specialist, Kolipatti.	To breed a suitable irrigated Cambodia cotton suitable for Coimbatore, Salem, Tiruchirappalli and Madurai districts.
11 Scheme for maintenance of nucleus of pure seeds of improved cotton strains.	Coimbatore ..	Cotton Specialist, Coimbatore.	To produce selfed seeds of all improved strains Co. 2, Co. 3, and Co. 4, Co. 5 and 4463.

(c) Schemes financed by the Indian Central Sugarcane Committee.

1 Scheme for Sugarcane Research in Madras State.	Anakapalle and Gudiyatham.	Sugarcane Specialist, Anakapalle.	To select useful strains of high yielding canes suited to different cane tracts of the State and for carrying out research in physiology, chemistry and diseases of sugarcane.
2 Scheme for Research on Sugarcane Borers, and other pests and biological control.	Coimbatore ..	Government Entomologist.	For research on sugarcane pests with reference to growth of cane weather conditions and parasites, of the cane borers with a view to control them.
3 Sugarcane Development Scheme—Liaison Sugarcane Farms.	Hospet, Samalkot, Nelikuppam and Kuttikalai and 24 taluks in 18 districts.	Sugarcane Specialist.	For increasing the yields of sugarcane round about the sugar factories and to concentrate and intensify the propaganda work in 24 taluks.

(d) Scheme financed by the Indian Central Oil Seeds Committee.

1 Scheme for improvement of coconut in East Godavari.	East Godavari district.	Oil-seeds Specialist.	To effect improvement in coconuts grown in the Northern Circars by breeding, manuring and cultural methods.
2 Scheme to run six zonal nucleus seed farms of improved oilseeds.	Madras State ..	Do.	For large scale multiplication of pure seeds of improved strains of oilseeds.
3 Scheme for large scale trials of insecticides and fungicides to control surul and tikka diseases of groundnut.	Tindivanam ..	Oil-seeds Specialist ..	For control of surul pest and Tikka leaf spot disease by use insecticides and fungicides.

List of Agricultural Schemes in progress in Madras State during 1952-53—cont.

Number and name of scheme.	Place of working.	Officer-in-charge.	Object of the scheme.
(e) Schemes financed by the Indian Central Coconut Committee.			
1 Scheme for research of coconuts in Madras State.	Nilleshwar	Oil-seeds Specialist ..	Research on economic and practical aspects of coconut to establish certain criteria for selection of seedling; that would ultimately yield well and study of button shedding and production, etc.
2 Scheme for establishment of coconut nurseries in the State.	Coimbatore, Tindivanam, Anakapalle, Maruteru, Aduthurai, Pattukkottai, Pattambi, Nilleshwar Marudur and Samalkota.	Do. ..	To produce and supply good quality seedling to the public on a large scale.
3 Scheme for multiplication of <i>Crotalaria striata</i> since terminated.	Malabar	Do. ..	To produce and distribute seeds of <i>Crotalaria striata</i> for cultivation in coconut gardens.
4 Scheme for the establishment of regional coconut research Station.	East Godavari district.	Do. ..	Pending acquisition of lands

(f) Schemes financed by the Madras Government alone.

1 Scheme for the multiplication of K. 5 and K.U. 1 cotton strains.	Coimbatore district ..	Assistant Cotton Specialist, Tiruppur.	To multiply and distribute pure seeds of K. 5 and MU. 1 cotton strains on large scale.
2 Scheme for purchase and distribution of H-1 cotton seeds in Bellary.	Bellary district ..	District Agricultural Officer, Bellary.	To purchase pure seeds of H-1 cotton strains and supply to the districts of Bellary, Anantapur, Kurnool and Cuddapah.
3 Combined scheme for multiplication and distribution of K. 2 KM. 1 and MU. 2 cotton.	Madurai, Tirunelveli and Ramanathapuram districts.	Assistant Cotton Specialist, K-2 and Co. 4 Cotton Scheme, Kollipatti.	To multiply and distribute on a large scale pure seeds of K-2 and MU. 1, and MU. 2 cotton strains in Madurai, Tirunelveli and Ramanathapuram districts.
4 Scheme for the investigation of land development and reclamation of waste lands in the State.	Whole State	Joint Director of Agriculture.	To survey and draw up a plan of reclamation of fallow and weed infested lands in Bellary district by tractors.
5 Scheme for the opening of regional Millets Research Sub-Stations.	Ariyalur, Tirupattur, Ongole and Ramanathapuram.	Millets Specialist, Coimbatore.	To evolve new strains of improved millets regions of the State.
6 Scheme for multiplication of 881 F. cotton (closed on 15th December 1952).	Kurnool	District Agricultural Officer, Kurnool.	To multiply and distribute seeds of 881 F. Cotton in the Mungari area of Ceded districts.
7 Scheme for multiplication and distribution of M.U.1 cotton in winter cropped areas of Coimbatore district.	Coimbatore	Assistant Cotton Specialist, Tiruppur.	To multiply and distribute pure seeds of MU. 1 Cotton in winter cropped areas of Coimbatore district.
8 Scheme for multiplication of improved gingelly seeds.	....	Oil-seeds Specialist ..	To multiply and distribute improved seeds of gingelly.
9 Free distribution of vegetable seeds.	Whole State	Director of Agriculture, Madras.	To encourage the cultivation of vegetables in schools and other similar institutions.
10 Scheme for multiplication and distribution of H. S. 9 and G.I. Chilli seeds.	Guntur	District Agricultural Officer, Guntur.	To multiply and distribute pure seeds of H. S. 9, seeds of tobacco and G.I. Chilli seeds.
11 Free distribution of seed materials of sweet potato, tapioca and kurkan.	Do.	Guntur.	To encourage the cultivation of subsidiary food crops and sweet potato, tapioca and kurkan.
12 Tungabhadra project of localization of ayacut.	Ceded districts ..	....	To demarcate areas suitable for different crops and cropping.
13 Scheme for biological control of coconut pests.	Razole	Plant Protection Officer (Entomologist).	To breed and release parasite black headed caterpillar pest of on coconuts for controlling.
14 Scheme for eradication of white borer of coffee.	Nilgiris	Government Entomologist.	To eradicate the white borer of coffee.
15 N. 14 Certification Scheme.	Kurnool district ..	Assistant Cotton Specialist, Nandyal.	To issue certificate on purity of Northern 14 Cotton to enable it to get exemption from price control.

List of Agricultural Schemes in progress in Madras State during 1952-53—cont.

Number and name of scheme.	Place of working.	Officer-in charge.	Object of the scheme.
(f) Schemes financed by the Madras Government alone—cont.			
16 Co. 4. Certification Scheme.	Coimbatore, Tiruchirappalli, Madurai, and Salem, Ramanathapuram and Tirunelveli districts.	Certification Officer, Rajapalayam.	To issue certificate on purity of Co. 4 cotton to enable it to get exemption from price control.
17 Development of Fruit Industry in Kodalkanal.	Kodalkanal, (Madurai district).	Fruit Specialist ..	To improve the fruit industry in Kodalkanal.
18 Scheme for training additional fieldmen and maistries.	Whole State	Director of Agriculture.	To provide additional trained fieldmen and maistries for extension work.
19 Opening of an Agricultural Research Station, Satyamangalam.	Coimbatore district ..	Government Agricultural Chemist	To study problems arising out of Lower Bhavani Project in Coimbatore district.
20 Scheme for study of laterite soils	Agricultural Research Station, Pattambi.	Do.	To find out the suitability of laterite soils for paddy cultivation.
21 Scheme for training of Agricultural and Botany graduates in Horticulture.	Coimbatore	Fruit Specialist, Coimbatore.	To give special training in Horticulture extending over a year for Agricultural and Botany graduates to provide trained personnel to man Horticultural Research and extension scheme.
22 Scheme for the establishment of model orchard nurseries in the State.	Selected districts in the State.	Fruit Specialist ..	To establish model orchards and nurseries which will serve as visual demonstrative centres of scientific orchard practices and nursery maintenance in an economic way.
23 Scheme for the large scale production of Ergot on Rye on the Nilgiris (permanent).	Nilgiris	Government Mycologist.	Production of high quality ergot.

Schemes jointly financed by the Indian Central Arecanut Committee and State Government.

1 Scheme for the investigation of stem breaking disease of arecanut palms in South Kanara district.	....	....	In operation.
2 Scheme for organization of Mahali campaign in South Kanara and Malabar districts.	....	....	Not put into operation during the year.

(g) Schemes financed partly by the Government of India.

1 Cotton extension plan for production of cotton in 1952-53—employment for the one year special staff.	Madras State	Cotton Extension Officer, Coimbatore.	For increasing the production of cotton by (1) extension of area, (2) manuring with ammonium sulphate, and (3) mixed cropping with oil seeds, chillies, and ragi and use of improved seeds.
2 Scheme for the control of pests of Cambodia cotton.	All area in Madras State where Cambodia cotton is grown.	Plant Protection Officer (Entomology), Coimbatore.	To combat pests on Cambodia cotton by distribution of pesticides at half cost.
3 Scheme for the mixed cropping of Irungu cholam with indigo as a crop preceding cotton.	Tirunelveli and Ramanathapuram districts.	Cotton Extension Officer, Coimbatore.	To extend cotton cultivation by encouraging mixed cropping of Irungu cholam and indigo as crop preceding cotton.
4 Scheme for the cultivation of cotton in rice fallows of Tanjore, Tiruchirappalli and South Arcot districts.	Tanjore, Pattukkottai, Tiruchirappalli and South Arcot.	Cotton Extension Officer, Coimbatore.	To extend cultivation of short duration cotton in the rice fallows of Tanjore, Tiruchirappalli and South Arcot districts.
5 Intensive Cultivation Schemes given below.	Whole State	Director of Agriculture and Joint Director of Agriculture.	To produce increased foodgrains as per target fixed.

List of Agricultural Schemes in progress in Madras State during 1952-53—cont.

Number and name of scheme.	Place of working.	Officer-in-charge.	Object of the scheme.
(g) Schemes financed partly by the Government of India—cont.			
1 Plant Protection Scheme.		Director of Agri-culture.	
2 Production and distribution of improved seeds of paddy.			
3 Production and distribution of improved seeds of millet.			
4 Production and distribution of improved green-manure seeds.			
1 Oil engine pumpsets ..		Joint Director of Agri-culture.	*For intensive food production.
2 Electric motor pumpsets.			
3 Tractor cultivation ..			
4 Central Agricultural Engineering stores.			
5 Distribution of ammonium sulphate.			
6 Distribution of phosphate fertilisers.			
7 Soil conservation Scheme, Nilgiris.			
8 Soil Conservation by Contour bundling in Ceded districts.*			
9 Intensive Manuring Scheme.			

The following two schemes which are partly financed by the Indian Council of Agricultural Research have been started during the year 1952-53 :—

(1) Scheme for research on eradication of weeds by herbicidal chemicals. The scheme was started on 3rd December 1952 with two assistants, two fieldmen and one peon under the Plant Physiologist, Coimbatore.

The scheme was sanctioned for one year at the first instance and for two more years with reduced staff, viz., with only one assistant and one fieldman.

The object of the scheme is to control or eradicate the most important weeds infesting food-crops in each region of the Indian Union. In this particular scheme the weeds to be taken up for investigation will be those recognized as most troublesome in Madras State.

(2) Scheme for the distribution of seed coconuts in the cyclone-affected areas of Tanjore district entirely financed by the State Government.

The scheme was sanctioned for a period of six months with an additional staff of three Upper Subordinates, two fieldmen and four malistries and three peons for procurement of one lakh of seed coconuts from West Coast for distribution in the cyclone-affected areas in Tanjore district. The seednuts procured will be distributed to the ryots at 6 annas each nut. The scheme started functioning from 14th March 1953.

The following schemes which are partly financed by the Indian Council of Agricultural Research were continued to be in operation during the year 1952-53 :—

- (1) Scheme for the improvement of sweet potato and tapioca.
- (2) Scheme for scientific aid to cardamom industry in South India.
- (3) Scheme for research for the investigations of Blast and Foot-rot disease of rice.
- (4) Scheme for the scientific aid to pepper industry in South India.
- (5) Scheme for improvement of pulses.
- (6) Scheme for improvement of chillies.
- (7) Scheme for research on the control of striga attack on sorghum.
- (8) Scheme for research on ginger cultivation.
- (9) Scheme for the multiplication and distribution of hybrid cumbu seeds.
- (10) Scheme for manurial varietal and agronomic trials to determine optimum yield.
- (11) Scheme for investigation of the possibilities of pre-soaking seeds in nutrient salts as a method of improving crop yields.
- (12) Scheme for starting a regional bee research station at Coimbatore.

Of the above schemes the scheme for the improvement of pulses has since been merged with the Millet Section and Indian Council of Agricultural Research are not financing the scheme with effect from 1st April 1953.

The following schemes which are being partly financed by the Indian Central Sugarcane Committee are also continued to be in operation during the year 1952-53 :—

- (1) Sugarcane research scheme at Anakapalle and Gudiyattam.
- (2) Sugarcane development scheme.
- (3) Sugarcane borer pest scheme at Coimbatore.

The following schemes entirely financed by the State Government continued to be in operation during the year 1952-53 :—

- (1) Scheme for the multiplication of improved strains of gingelly seeds.
- (2) Scheme for the running of Agricultural Research Station at Satyamangalam in the Lower Bhavani Project area.
- (3) Scheme for the large-scale production of Ergot of Rye on the Nilgiris. (This has been sanctioned on a permanent basis).

APPENDIX No 20.

Programme of work for 1953-54.

Research.—Research activities of the Department will be diverted towards problems of integrated production plan and with this end the following programme for 1953-54 is drawn up.

Agricultural Education and Training.—The admission into the Agricultural College at Coimbatore and Bapatla will be kept at 08 each, including readmission of failed students. Horticultural training for 90 Agricultural and Botany Graduates will be continued.

Agricultural Chemistry.—The following are the main items on the programme :—

- I. Geo-Chemical and Physico-Chemical Studies of Soils.**—(i) Rapid soils tests for the estimation of available P₂O₅ in other types.
- (ii) Geo-Chemical studies of paddy soils other than deltas will be taken up.
- (iii) The foliar diagnosis of nutrient deficiencies of soils.
- (iv) Studies on laterite soils.
- (v) Studies on salinization and de-salinization of the black cotton soils of the Tungabhadra Project area. Suitable crop rotation for this area.
- (vi) Laboratory, pot culture and field trials to see the changes in the soils of the Lower Bhavani Project area with the advent of irrigation. Suitable cropping schemes and methods for improving the fertility status of the soils will also be evolved.
- (vii) The studies on the effect of green manure on the physico-chemical properties of soils.
- (viii) Run-off studies.

II. Soil Biology.—(i) Studies on the microbiology of the different zones of red and black soils of Coimbatore.

(ii) Isolation of more efficient strains of root nodule bacteria for all the legumes of the State.

(iii) Assessment of nitrogen fixing capacity of the common leguminous crops of the State.

(iv) Saline tolerance limit of leguminous crops.

(v) Water requirements of the common leguminous crops.

III. Plant Chemistry.—(i) Plant nitrogen of dry and irrigated crops.

(ii) Common green manure crops and their comparative merits on the paddy yield.

IV. Manures.—(i) (a) The nitrogen and phosphorous requirements of the soil types of paddy areas in Tanjore delta will be determined.

(b) Analysis of the samples collected during the soil survey in Tanjore district.

(ii) Co-ordinated set of manurial trials in different parts of the State.

(iii) Organic matter requirement of dry and irrigated soils of different soil-climatic zones.

Plant Physiology—Pre-treatment Studies including Vernalization.—Work will be conducted as per the technical programme of the Indian Council of Agricultural Research Scheme. A large number of seeds will be treated with various nutrient salt solutions alone and in combination with trace elements and the trials conducted.

Weed Control by Chemical Herbicides.—Studies will be continued with pure weedicide chemicals as well as some trade products on five major weeds, viz., *Cyperus*, *rotundus*; *Hariyali*, *Aristolochia bracteata*, *Triathema portulacastrum* and *Spurrey*.

Viability and Dormancy Studies.—(a) The studies with Tetrazolium salt as a means of rapid estimation of percentage of germination.

(b) Induction and breaking dormancy in the case of groundnut, paddy, cotton, etc.

Agricultural Entomology—I. Pests of paddy.—(a) Research on the insecticidal method of control of—

- (i) The paddy stem borer—*Schoenobius incertellus*,
- (ii) The paddy mealy bug—*Ripersia ozana*, Gr.

(b) Control of field rats : *Bandicota Bengalensis* : Z G & K.

Millardia melitada by poison baiting, trapping, catching by professionals, etc.

II. Pests of vegetables.—(i) Control of sweet potato weevil—*Cylas formicarius* Fb.

(ii) The potato tuber moth : *Phthorimaea operculella* Z.—Insecticidal methods of control.

(iii) The vein clearing disease of bhendi, and

(iv) The little leaf disease of brinjal.

III. Pests of fruits.—Control by insecticidal means of—

- (i) The fruit sucking moth—*Othreis* sp.
- (ii) Fruit flies on plums—*Chaetodacus* sp.
- (iii) The orange thrips—*Tirips* sp.

IV. Pests of cotton.—The cotton spotted boll worm—*Earias* sp. Insecticidal methods of control against the pest.

V. Pests of coconut.—(i) The rhinoceros beetle—*Orctes rhinoceros*, L—

VI. *Pests of stored products*.—(i) Studies on the immunity conferred by different synthetic chemicals against stored products pests when treated with seed materials. Fumigation of Ginger, oil seeds.

VII. *Work on insecticides and fumigants*.—(i) Tests of proprietary products new chemicals,

- (ii) Work on soil insecticides,
- (iii) Vegetable insecticides,
- (iv) Adverse effects of synthetic chemicals with reference to phytotoxicity.

VIII. *Biological Control*.—(i) Studies on *Cryptolaemus Montrouzieri*.

- (ii) Exploring possibilities of finding out new parasites of important crop pests.

IX. *Systematic work*.—Orthoptera, Lepidoptera, Coccidae, Coccinellidae, Bruchidae, Curculionidae, Aphididae, Fulgoridae, Formicidae, Syrphidae, Acarina, Hymenopterous predators and Trypetidae.

X. *Fundamental research*.—(i) Bionomics of important Coccinellidae predaceous on aphids and scales in South India, (ii) Biological control as a supplement to the chemical control of insect pests-aphids.

Schemes—Item I.—Fundamental studies on sugarcane borers—Indian Central Sugarcane Committee Scheme.

Item II—Bee-keeping. (Indian Council of Agricultural Research Scheme.)

Agricultural Mycology—(1) Studies on *Pythiaceus fungi*.—Investigations on Pythiaceus fungi will be continued.

(2) *Rice diseases* (a) *Blast Piricularia oryzae*.—Further tests on the resistance of promising cultures of rice to blast will be made.

(b) *Foot rot*.—*Fusarium moniliforme*.—The efficacy of new fungicides on the control of foot rot.

(c) *Stem rot*.—*Sclerotium oryzae*.—The reaction of different varieties of rice usually grown during the Kuruvai season to this rot will be assessed.

(3) *Rice blast—Piricularia Sp.*.—Promising cultures and selections of ragi will be further tested to assess their susceptibility to blast.

Researches on the following:

(4) *Cereal rusts*.—

- (a) Wheat rusts.—*Puccinia graminis*—*P. Triticina* and *P. Glumarum*.
- (b) Sorghum rust.—*Puccinia Purpurea*.
- (c) Cumbu rust.—*Puccinia Purpurea*.
- (d) Tenai rust.—*Uromyces setariae Italicae*.

(5) *Cotton diseases*.—

- (a) Black arm.—*Xanthomonas malvacearum*.
- (b) Root rot.—*Rhizoctonia Bataticola*.

(6) *Vegetable diseases—Wilt and Root rots*.

(7) *Diseases of Pulses—Root rot and anthracnose*.

(8) *Banana diseases—Wilt and anthracnose*.

(9) *Orange diseases—Limb breakage*.

(10) *Ergot of rye—Claviceps purpurea*.

(11) *Stem breaking disease of areca*.

(12) *Fungicidal trials*.

(13) *Systematic Mycology*.—New collections of fungi will be examined and identified as and when available.

Systematic Botany.—Besides Herbarium work, the following items of Research will be carried out during the Fasli year 1953-54:—

I. *District floras*.—The Flora of Tirunelveli district will be finalized. The different taluks of Ramanathapuram district will be surveyed and specimens collected.

II. *Acclimatization trials*.—Trials of grasses, legumes and green manure plants from seeds obtained from foreign countries.

III. *Soil conservation purposes*.—Grasses, legumes and nonlegumes suitable for soil conservation purposes.

IV. *Essential Oil yielding plants*.—Available species of *Cymbopogon* will be collected Patchouli and Peppermint will also be tried.

V. *Germination Studies*.—Will be conducted.

Cytogenetics.—Cytogenetical studies in paddy, millets and horticultural crops and plants will be continued. Chromosome numbers of cultivated crops and their wild and allied species will be worked out.

Agricultural Engine Room Research.—Testing of new implements and machinery received from firms. Possibilities of adopting indigenous implements to the tractors will be pursued. Investigation into the cost of working of tractors, oil engines pumpsets, electric-motor pumpsets and causes for idle hours of tractors will be pursued. Draft on implements and water table studies will be continued. Mechanised cultivation of paddy and groundnut and other crops will be pursued to study possibilities in this direction.

Agro-Industries—I. Canning of fruits and vegetables.—Varietal and processing trials in mango and other fruits will be continued, including those not previously studied and where further work has been indicated as necessary. Work will be pursued on a larger scale where preliminary trials have given promising indications. Composite packs of fruit and fruit pulps will be attempted further. Special attention will be paid to fruits like mango, jack, musk melon, palmyrah, papaya, etc., and vegetables such as ash-gourd, carrots, etc.

II. *Juices, squashes, cordials and syrups*.—Work on new product and new process development and formulation of better recipes will be continued. Work on carbonated and spiced beverages and multi-fruit cocktails will be pursued.

III. *Jams, Jellies and Marmalades*.—Work on new product will be continued.

IV. *Candying of fruits and vegetables*.—Candying by dehydration and in fruit juice syrups will be studied with particular reference to palmyra kernels, ash-gourd and bottle gourd.

Crops—Improvement work—Paddy.—The following items of work will be carried out:—

I. *Pure-line selection*.—Maintenance of purity of stocks of the strains and study of single plant selections.

II. *Hybridization*.—(1) Blast resistant studies will be continued.

(2) *Study of special crosses*.—(a) GEB 24 × Kolamba profuse

(b) Kavinginpothala × GEB 24.

(3) Evolution of flood resistant and = Saline resistant strains.

(4) Study of the progenies of crosses between cultivated and wild rices.

(5) Study of the F₃s of crosses made for induction of "Dormancy" in short duration strains.

(6) Study of crosses for evolution of short and medium duration strains.

(7) Study of F₂s and F₃s of crosses between Japonica and India types.

III. *Manurial trials*.—(1) Experiment on graded doses of P₂O₅ and leaf.

(2) Placement of ammonium sulphate versus the local method of application.

(3) Methods of application of P₂O₅ to paddy land.

(4) N and P₂O₅ at 0.30, 45 and 60 lb. levels alone and in combination.

(5) Conduct of the Japanese method of paddy cultivation as practised in Gramodyog

•Kendra.

(6) Conduct of the factorial experiment designed by the Indian Council of Agricultural Research on Japanese method of cultivation.

IV. (1) Adoption of the methods of making the paddy cultivator self-sufficient in regard to green leaf requirements.

(2) Growing of cotton and groundnut in rice fallows.

(3) Continuation of the studies on improvement of tuber crops, sweet potato and tapioca, under a scheme of the Indian Council of Agricultural Research.

Calcium carbonate slurry experiment.

Studies on laterite soils.—Heavy doses of lime, 1,500 lb. and 3,000 lb. in combination with green leaves 5,000 lb. to 75,000 lb. to find out if there response to application of phosphates.

Trial of dicalcium phosphate—Cultural experiment.—Stem-borer trials with different insecticides.

Millets—

1. *Millets* (a) *Cholam*.—(A) Maintenance of types.

(B) *Rainfed cholams*.—(i) *Periamanjai cholam*.—Evolution of strains of Periamanjai cholam superior to Co. 1 in grain yield and quality of straw.

(ii) Evolution of short duration types for late sowings in Coimbatore district.

(iii) *Talaivirichan cholam*.—Improvement of grain size and fodder quality by hybridization.

(iv) *Irungu cholam*.—Improvement of grain size and colour and fodder quality.

(C) *Irrigated cholams*.—Improvement of grain size and juiciness of stem in Sen cholam, Chinnamajal cholam and Vallai cholam.

(D) *District trials*.

(E) *Fundamental Research on Sorghum*.

(b) *Ragi*.—(i) Maintenance of types.

(ii) Evolution of short duration (90 days) strains.

(iii) Evolution of high yielding strains suited to the West Coast and the Nilgiris district.

(iv) Evolution of high yielding strains resistant to *Piricularia*.

(v) Fundamental studies on ragi.

(vi) Trial in the districts.

(vii) Multiplication and distribution of seeds of improved strains.

(c) *Tenai*.—(A) Evolution of high yielding strains.

(B) Evolution of rust resistant strains.

(C) Trial of improved selections and strains in the districts.

(D) *Fundamental Research*.—Study of tillering habit.

(d) *Minor millets*.—(i) Evolution of improved strains of varagu, samai, panivaragu and kudraivall.

(ii) Trial of improved strains in the districts.

2. *Pulses*.—(i) Evolution of high yielding strains for the State and multiplication and distribution of seed of improvement strains of redgram, greengram, blackgram, bengalgram, lablab field variety.

- (ii) Study of types in redgram, vegetable cowpea, Soyabeans and Bean.
- (iii) Evolution of high yielding strains of cowpea grain types.

3. *Hybrid cumbu scheme (Indian Council of Agricultural Research)*.—(i) Collection and study of new samples and selection of desirable types and also maintenance of pure lines of representative areas.

- (ii) Inbreeding of the selections.
- (iii) Initial crossing of inbreds F. 3 generation.
- (iv) Testing the initial crosses and other crosses for yield in row yield trial plots.
- (v) Final trials in yield trial plots.
- (vi) Comparison of seeds of superior hybrids produced by artificial and natural pollinations for yield.

(vii) Trial in the districts.

(viii) Multiplication of seeds in seed farms.

4. *Scheme for the control of striga on sorghum (Indian Council of Agricultural Research)*.—(i) Evolution of high yielding strains of sorghum resistant to striga by selection and hybridization.

(ii) *Agronomic experiments*.—(a) Hand weeding and spraying and (b) chemical treatment of soils.

Oil seeds—Groundnut.—

- (1) Comparative yield trials with bunch and spreading types.
- (2) Preliminary yield trials of bunch and spreading selections.
- (3) Seed multiplication of selections.
- (4) *Replicated row tests will be carried out*.—Thirty bunch and thirty-three spreading

selections which have shown promise in the row tests will be put under replicated row tests along with TMV. 2. bunch and local spreading groundnut and tested for yield and purity.

(5) *Row tests*.—Single plant selections will be tried under row tests.

(6) New varieties and types will be shown in small plots for detailed study and further selection.

(7) *Hybridization*.—F. 2 and F. 3 progenies of earlier crosses will be raised along with their parents and studied in detail.

New crosses between selected pure lines will be attempted with the following objectives:—

- (1) To evolve a dormant bunch type.
- (2) To evolve a white seeded strain.
- (3) To reduce the duration of A.H. 6481.

(8) *Manurial experiment*.—The experiment will be repeated and the results of previous years confirmed. The optimum and economic doses of potash and phosphoric acid required to be applied to the groundnut crop.

(9) Cultural experiment and rotation experiment will be repeated.

(10) *Mixed cropping of cotton and groundnut harvesting and curing trials*.—The economics of mechanical cultivation as compared with local implements will be worked out. The study of the effect of different chemicals in breaking the dormancy of spreading groundnuts will be repeated. The pesticides such as DDT and BHC. 5 per cent will be raked in at different intervals and the effect and economics of the pesticides in controlling the pest will be studied.

District trials will be conducted.

Gingelly.—

- (1) Preliminary yield trials.
- (2) Replicated row tests.
- (3) *Hybridization*.—Fresh crosses to evolve cosmopolitan types.
- (4) Seed multiplication of strains for large scale distribution.
- (5) Spacing trials will be repeated.
- (6) Study on the deterioration of gingelly seeds under storage.
- (7) Time of sowing experiments.

Castor.—The following studies will be pursued:—

- (1) Comparative yield tests.
- (2) Preliminary yield tests of selections.
- (3) Replicated row tests.
- (4) Purity studies.
- (5) *Hybridization*.—The F. 1 and F. 2 progenies of crosses made earlier will be

grown along with their parents and studied.

Coconut.—Manurial experiments on adult coconut trees will be continued.

(2) Cultural experiments will be carried out.

(3) Increasing the humus content of the soil: trial of newly introduced green manure crops.

(4) Trial of various subsidiary crops for coconut gardens, to spot out the most suitable and remunerative crops.

Button shedding.—Trial of proprietary chemicals to control button shedding.

(6) Study of exotic and State varieties of coconut.

Cotton.—The research work during 1953-54 will cover all those items of work that are unfinished and require to be pursued with the object of evolving cosmopolitan types of American and desi cottons excelling the standard strains, Madras Cambodia Uganda. 1, Karunganni 5 and Karunganni 2, in quality and if possible in yield also. The work on perennial cottons and wild cotton hybrids will be continued. The study on the suitability of varieties to rice and fallows is proposed to be continued in an intensive manner under a scheme to be specially sanctioned for the purpose. The fundamental studies on the genetics of mutant types, lint quality and lint quantity will be continued. The study of heterosis in inter-specific hybrids will be developed. The study of purity maintenance in improved strains will continue to engage the serious attention of the station. In collaboration with the Agricultural Entomologist, it is intended to explore the possibility of utilizing more recent synthetic chemical insecticides for an effective control of jassids and aphids, without producing any adverse effects on cotton yields.

Sugarcane.—Study of the varieties in the study plots and in yield trials will be continued. Performance of varieties under conditions of water logging with reference to the time of swampiness will be assessed. The effects of continuous application of ammonium sulphate are under investigation in the permanent manurial experiment. The experiment to compare the efficacy of Chilean nitrate with ammonium sulphate as a nitrogenous fertilizer will be continued. Studies on methods of planting, and storage of jaggery are also programmed. The experiment on time of planting and harvest will be continued at Gudiyattam. In the division of Chemistry, nitrogen nutrition of cane, foliar diagnosis and composition of cane juices and resultant jaggeries, and trial of clarificants in jaggery making will be the subjects of study. In physiology, water requirements of sugarcane crop in relation to loamy and clayey soils are under study for 1953-54. Other items of the programme include investigation on lodging of cane and use of weedicides. In Mycology division, the varietal resistance studies to smut and loss due to the incidence are also in programme. In Entomology, chemical control of borers, effect of mealy bugs on germination and control measures for other pests will be studied.

In paddy yield trials with promising cultures, and the co-ordinated manurial experiment are to be continued. Seed multiplication of ragi, ganti and jonna and propagation of important fruit plants are also planned for 1953-54.

Fruits—Fruits for the plains.—Varietal collection and maintenance of performance records of individual trees will be continued in all fruits. Root stock studies in mango and citrus will be continued. The new root stock trials for Sathugudi orange, lemons and limes will be continued. Studies on flowering in relation to age and growth of shoots and blossom biology in mango will be continued. Classification and nomenclature of citrus location of budsports will be continued. Pruning trials with guava and hybridization in mango, citrus and guava will be done. Introduction of economic plants and studies in propagation methods in different fruits will be pursued.

Hill Fruits.—Varietal collection, propagation and trial of root stocks, pruning and training trials with apples, peach and plum will be pursued at Coonoor and pollination trials with plum will be continued. Studies on pyrethrum and strawberry and collection of new varieties of vegetables will be made at Kallar and Burliar gardens. Cocoa mangosteen, bread fruit, etc., will be multiplied for supply to the public. Hybridization work in fruit plants will be intensified.

Banana.—At the Central Banana Research Station, Aduthurai, varietal collection, location for mutants, determination of suitable suckers, for planting, optimum time of planting will be pursued. Ratooning and mattocking trials and manurial experiments on banana will be pursued in respect of desuckering, thinning, manuring, and soil cultivation.

Potato.—Introduction and trial of new varieties, manurial trials, trials with liming and early and late planting, rotation and contour planting will be continued.

Chillies.—The following items of work will be carried out:—

- (A) *Breeding* (1).—Trial of promising cultures on cultivators' holdings.
- (2) Study of promising cultures in replicated small bulk yield trials.
- (3) Study of promising cultures in family blocks.
- (4) Study of cultures in progeny rows.
- (5) Study of collections obtained from different parts of India and abroad under observation plots.

- (6) Study of variety in the second, third and fourth generation hybrids.
- (7) Study, including hybrid vigour, of first generation crosses.
- (8) Synthesis of fresh crosses.

(B) *Fundamental*.—(1) Thrips resistant studies.

(2) Studies on pungency.

(C) *Agronomic*.—Experiments on cultural and agronomic aspects for increasing production in chilli.

Pepper.—The following items of research will be pursued:—

- (1) *Varietal collection*.—New indigenous types and material from other countries will be added.
- (2) *Morphological studies*.—Detailed morphological descriptions will be recorded and a key for the identification of different types and varieties evolved.

- (3) Blossom biological studies and evolving a proper technique.
- (4) *Hybridizing pepper*.—To evolve new pepper strains controlled pollination between selected parents will be carried out.
- (5) *Study of the manurial requirements of pepper*.—A uniform stand of vines to all the standards in the experiment already initiated will be established, so that the manurial application can be started in 1954-55.
- (6) Studies on pollu incidence and evolving Pollu resistant strains of pepper by selection.
- (7) Studies on the incidence of wilt and evolving wilt resistant strains of pepper by selection.
- (8) Studies on spike shedding.
- (9) *Propagation studies*.—Cuttings and layering experiments. Experiments to determine the optimum nursery technique, pre treatment of seed and the period of viability of the seeds will.
- (10) Root stock trial for pepper will be carried out.

Cardamom.—The following work will be carried out:—

- (1) Hybridization among Singampatti cardamoms and among the varieties and types of South India.
- (2) Yield trials of Singampatti selections to be continued and concluded.
- (3) Resistance to pests and diseases manifested by the above selections.
- (4) Continuation of varietal trials yield in various types and varieties of South India under varietal trials will be recorded.
- (5) Resistance to pests and diseases manifested by the various varieties will be assessed.
- (6) Manurial experiments to find out the most suitable manure or manures for cardamoms and determination of their dosages.

Ginger.—Investigation into cultivation and diseases of ginger will be carried on at Patbambi.

Tapioca and sweet potato.—Trial of varieties, manure and cultural experiments as per technical programme of the scheme will be pursued.

General.—The extension staff in the districts will continue to concentrate their attention on the supplies and works schemes of the Intensive Cultivation schemes under the Five-Year Plan. The campaigns of intensive growing of 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, will be maintained to ensure efficient progress. The several Intensive Cultivation schemes will be continued to achieve the targets. 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, distribute loans and advise them on all agricultural improvements. Preservation of cattle-manure and preparation of compost will be demonstrated extensively. Use of Urban compost will be popularized.

Trials of improved strains of paddy, millets, sugarcane, oil-cakes, pulses, cotton, etc., will be continued. Supplies of seedlings, grafts, etc., of fruit plants, vegetables and subsidiary food-crops will be maintained.

Bee-keeping.—Bee-keeping will be extended and popularized in the districts. The scheme with special maistries will be continued in the districts of Srikakulam, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur and Chittoor.

Loans.—Loans for the purchase of seeds and manures and implements will be issued on a much wider scale. Special manure loans will be issued for purchase of fertilizers in all the districts.

Control of pests and diseases 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.

Cotton Extension Work.—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.

Vanamahotsava.—Will be celebrated in all the districts in the first week of July, 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 languages. Pamphlets on agricultural subjects will be distributed to farmers on all occasions like festivals, fairs and shandies. Popular handbooks 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 Newsletter and Press Notes will be continued as periodical features.

Exhibitions.—Exhibitions and shows will be organized in 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.—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 farmers' lands by tractors hired, supply of tractors on hire-purchase basis, supply of pumpsets will be continued. Trial with various agricultural implements and machinery will be continued.

Irrigation appliances.—Hiring of oil engine pumpsets and sale directly through firms will be continued. Supplies of electric motor pumpsets will be continued. River pumping will be expanded.

Tube-wells.—The sinking of filter point tube-wells will be extended to all coastal districts and other areas of High Water table to utilize sub-soil water effectively in summer and pre-monsoon periods with a view to raise more crops.

Hire-purchase (cases).—Oil engines and electric motor pumpsets will be distributed on hire-purchase basis to aid poor cultivators to take to power lift irrigation and raise crops profitably.

Fertilizers.—Supply of fertilizer like sulphate of ammonia will be maintained as per targets.

Hillmen Uplift Schemes.—Aids to poor and backward hill-tribes to facilitate their farming profitably will be continued.

Colonization Schemes.—Work in the colonization schemes will be continued.

Projects.—Crop planning for farmers in the new irrigation project 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 12 market committees. Market reports, prices statistics, reviews of market conditions will be continued. Advice on general marketing matters will be given to other departments.

Soil conservation.—Contour bunding in the districts of Chittoor, Bellary, Coimbatore will be continued and soil conservation measures will be adopted on the Nilgiris.

APPENDIX No. 21.

Appointments, postings and transfers of Gazetted Officers.

Post.	Period.		Name of the officer-in-charge.
	From	To	
	HEADQUARTERS.		
Director of Agriculture ..	(Throughout.)		Sri M. S. Sivaraman, I.C.S.
Joint Director of Agriculture (Engineering).	Do.		" B. M. Lakshmipathi Mudaliar.
Joint Director of Agriculture (Extension).	Do.		" M. Kanti Raj.
Personal Assistant ..	1 July 1952 ..	8 Mar. 1953 ..	" V. Venkatrayudu.
	4 Mar. 1953 ..	To date ..	" E. S. Nagesan.
	(Throughout.)		" Dr. K. G. Naik.
Headquarters Deputy Director of Agriculture (Research).	1 July 1952 ..	9 Jan. 1953 ..	" V. K. Subramania Mudaliar.
Headquarters Deputy Director of Agriculture (Inspection).	10 Jan. 1953 ..	To date ..	" S. N. Venkataramana Ayyar.
Gazetted Assistant ..	1 July 1952 ..	18 Dec. 1952 ..	" T. Natarajan.
	19 Dec. 1952 ..	To date ..	" T. K. Thangavelu.
Cane Development Officer ..	19 Dec. 1952 ..	To date ..	" T. Natarajan.

Appointments, postings and transfers of Gazetted officers—cont.

HEADQUARTERS—CONT.

Post.	Period.		Name of the officer-in-charge.
	From	To	
HEADQUARTERS—cont.			
State Marketing Officer ..	1 July 1952 ..	9 Jan. 1953 ..	Sri S. N. Venkataramana Ayyar.
	10 Jan. 1953 ..	19 Jan. 1953 ..	" S. N. Venkataramana Ayyar, Headquarters Deputy Director of Agriculture (Inspection) in additional charge.
Assistant Marketing Officer	20 Jan. 1953 ..	To date ..	Sri V. Satagopan.
Assistant Agricultural Engineer (Headquarters) I.	(Throughout.)		" D. Shanmugasundaram.
	1 July 1952 ..	18 Dec. 1952.	" P. Rajavadan.
	19 Dec. 1952 ..	12 Jan. 1953..	" K. Natarajan.
Assistant Agricultural Engineer (Headquarters) II.	13 Jan. 1953.	To date ..	" K. P. Sanjeeva Shetty.
	1 July 1952 ..	25 June 1953.	" S. E. Anantaraman.
Assistant Agricultural Engineer (C.A.E.S.)	26 June 1953 ..	24 Sep. 1953..	" P. K. Radhakanth.
	1 July 1952 ..	31 July 1952.	" K. P. Sanjiva Shetty.
	1 Aug. 1952 ..	25 Aug. 1952.	" C. R. Shanmugam.
	26 Aug. 1952 ..	28 Aug. 1952.	" P. Rajavadan, Assistant Agricultural Engineer I in additional charge.
	29 Aug. 1952 ..	12 Jan. 1953.	" K. P. Sanjeeva Shetty.
	13 Jan. 1953 ..	To date ..	" K. Natarajan.
Senior Accounts Officer ..	(Throughout.)		" P. Sreeramamurthy.
Assistant Accounts Officer (Internal Audit).	Do.		" K. Viswanathan Nair.
Junior Accounts Officer (Internal Audit).	Do.		" T. Krishna Shetty.
Special Deputy Director (Crop Sampling), Madras.	1 July 1952 ..	6 Nov. 1952 ..	" V. Satagopan.
	7 Nov. 1952 ..	27 July 1953 ..	" K. Venkataraman.
Special District Agricultural Officer (Crop Sampling), Madras.	1 July 1952 ..	18 Aug. 1952 ..	" J. H. S. Ponnayya.
	19 Aug. 1952 ..	To date ..	" K. Santhanam.
Assistant Agricultural Engineer (State Farming Scheme), Madras.	1 July 1952 ..	31 Dec. 1952..	" Leo Swamikan.

DISTRICTS.

Marketing Section.

Assistant Marketing Officer, Kakinada.	1 July 1952	14 May 1953	Sri V. Suryanarayana.
	15 May 1953	4 June 1953	" V. Lakshminpathy Rao, Marketing Assistant Kakinada in additional charge.
	5 June 1953	27 Aug. 1953	" V. Suryanarayana.
Assistant Marketing Officer, Cuddapah.	1 July 1952	16 Dec. 1952	" T. K. Thangavelu.
	17 Dec. 1952	6 Jan. 1953	" T. Krishna Reddi, District Agricultural Officer, Cuddapah in additional charge.
	7 Jan. 1953	8 Apr. 1953	" U. B. Muhammad Abbas.
	9 Apr. 1953	24 Sep. 1953	" T. Krishna Reddi.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer-in-charge.
	From	To	
DISTRICTS—cont.			
Marketing Section—cont.			
(Throughout.)			Sri K. Narayanan Nair.
Assistant Marketing Officer, Tiruchirappalli.			
Assistant Marketing Officer, Coimbatore.	1 July 1952	29 Oct. 1952.	„ C. Raman Moosad.
Do.	30 Oct. 1952	30 Nov. 1952.	„ A. Ramadoss.
Do.	1 Dec. 1952	8 Dec. 1952.	„ C. Raman Moosad, Superintendent, Central Farm, Coimbatore in additional charge.
Do.	9 Dec. 1952	To date	„ C. Raman Moosad.
Agricultural College, Coimbatore.			
Principal	1 July 1952	9 Oct. 1952.	Sri P. D. Karunakar.
Do.	17 Jan. 1953	19 Jan. 1953.	„ P. Krishna Rao, Millet Specialist and Vice-Principal in additional charge.
Do.	20 Jan. 1953	1 Feb. 1953.	„ T. S. Ramakrishnan, Government Mycologist and Vice-Principal in additional charge.
Do.	2 Feb. 1953	To date	„ R. Balasubramaniam.
Agronomist and Professor of Agriculture.	1 July 1952	9 Oct. 1952.	„ V. T. Subbiah Mudaliar.
Do.	10 Oct 1952	13 Oct. 1952.	„ A. H. S. Sarma, Lecturer in Agriculture in additional charge.
Do.	14 Oct. 1952	3 Apr. 1953	„ P. A. Venkateswara Ayyar.
Do.	4 Apr. 1953	30 May 1953.	„ A. H. S. Sarma, Lecturer in Agriculture in additional charge.
Do.	31 May 1953	To date	„ P. A. Venkateswara Ayyar.
Lecturer in Agriculture	1 July 1952	9 Dec. 1952.	„ A. H. S. Sarma.
Do.	10 Dec. 1952	17 Dec. 1952.	„ P. A. Venkateswara Ayyar, Agronomist and Professor of Agriculture in additional charge.
Do.	18 Dec. 1952	To date	„ A. H. S. Sarma.
Lecturer in Animal Hygiene.	1 July 1952	11 Nov. 1952.	„ Francis Joseph.
Do.	12 Nov. 1952	31 Dec. 1952.	„ S. N. Vaidyanathan, Assistant Lecturer in additional charge.
Do.	1 Jan. 1953	30 Apr. 1953.	„ Francis Joseph.
Do.	1 May 1953	To date	„ S. N. Vaidyanathan, Assistant Lecturer in additional charge.
Lecturer in Agricultural Economics.	(Throughout.)		„ S. V. Doraiswami Ayyar.
Lecturer in Entomology	Do.		K. P. Ananthanarayanan.
Gazetted Assistant Lecturer in Entomology.	1 July 1952	6 Aug. 1952.	„ A. R. Seshadri.
Do.	7 Aug. 1952	To date	„ S. Kanakaraj David.
Lecturer in Mycology	(Throughout.)		„ K. Kandaswami.
Lecturer in Chemistry	1 July 1952	28 Feb. 1953.	„ M. Sundaram.
Do.	1 Mar. 1953	20 May 1953.	„ M. R. Balakrishnan.
Do.	21 May 1953	30 June 1953.	„ M. Sundaram.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period.		Name of officer-in-charge.
	From	To	
DISTRICTS—cont.			
Agricultural College, Coimbatore—cont.			
Gazetted Assistant Lecturer in Chemistry.	1 July 1952	15 Jan. 1953.	Sri V. V. Kumara Sastry.
Do.	16 Jan. 1953	22 Jan. 1953.	„ M. Sundaram, Assistant Agricultural Chemist in additional charge.
Do.	23 Feb. 1953	28 Feb. 1953.	„ D. V. Krishna Rao.
Do.	1 Mar. 1953	20 May 1953.	„ M. Sundaram.
Do.	21 May 1953	30 June 1953.	Dr. A. Mariakulandai.
Systematic Botanist and Professor of Botany.	1 July 1952	5 Apr. 1953.	Sri C. Rajasekhara Mudaliar.
Do.	6 Apr. 1953	30 June 1953.	„ D. Daniel Sundararaj, Assistant Lecturer and Systematic Botanist in additional charge.
Assistant Lecturer and Systematic Botanist.	(Throughout.)		D. Daniel Sundararaj.
Lecturer in Civil Engineering.	1 July 1952	20 July 1952.	„ K. T. Guruswamy, Civil Supervisor in additional charge.
Do.	21 July 1952	30 June 1953	„ B. K. Sadasiva Rao.
Lecturer in Mechanical Engineering.	1 July 1952	17 June 1953.	„ P. K. Radhakanth.
Do.	18 June 1953	To date	„ S. Gonselves.
Cytogeneticist, Coimbatore.	(Throughout.)		Dr. N. Krishnaswamy.
Cytogeneticist, Bapatla at Coimbatore.	1 July 1952	27 Jan. 1953.	„ S. Sampath.
Do.	28 Jan. 1953	30 June 1953.	Dr. N. Krishnaswamy in additional charge.
Plant Physiologist	(Throughout.)		Sri T. R. Narayanan.
Superintendent, Central Farm, Coimbatore.	1 July 1952	30 Oct. 1952.	„ K. Ramaswami Ayyar.
Do.	31 Oct. 1952	8 Dec. 1952.	„ C. Raman Moosad.
Do.	9 Dec. 1952	30 Dec. 1952.	„ T. N. Balasubramaniam.
Do.	31 Dec. 1952	To date	„ K. Ramaswami Ayyar.
Agricultural College, Bapatla.			
Principal	1 July 1952	25 Jan. 1953.	Sri R. Balasubramaniam.
Do.	26 Jan. 1953	29 Mar. 1953.	„ P. D. Karunakar.
Do.	30 Mar. 1953	29 July 1953.	„ G. Venkatanarayana.
Senior Lecturer in Agriculture.	1 July 1952	5 July 1952	„ D. Hanumantha Rao.
Do.	6 July 1952	31 Aug. 1953.	„ Md. Khasim Adeni.
Junior Lecturer in Agriculture.	1 July 1952	21 July 1952.	„ M. Narasimhan.
Do.	6 Jan. 1953	15 Feb. 1953.	„ G. Ranganadhaswamy.
Do.	16 Feb. 1953	23 June 1953.	„ M. Vaidyanathan.
Do.	24 June 1953	30 June 1953.	„ Md. Khasim Adeni, Senior Lecturer in Agriculture in additional charge.
Lecturer in Chemistry	1 July 1952	18 July 1952.	„ M. R. Balakrishnan.
Do.	19 July 1952	23 Jan. 1953.	Dr. P. Satyanarayana, Gazetted Assistant in additional charge.
Do.	24 Jan. 1953	31 Aug. 1953.	Dr. P. Satyanarayana.
Gazetted Assistant	1 July 1952	23 Jan. 1953.	Sri P. Satyanarayana.
Do.	24 Jan. 1953	31 Aug. 1953.	„ V. V. Kumara Sastry.
Lecturer in Entomology	1 July 1952	20 July 1952.	„ C. S. Balasubramaniam.
Do.	21 July 1952	31 Aug. 1952.	„ N. Raghava Rao.
Do.	1 Sep. 1952	24 Sep. 1953.	„ C. S. Balasubramaniam.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period.		Name of officer-in-charge.
	From	To	
DISTRICTS—cont.			
Agricultural College, Bapatla—cont.			
Gazetted Assistant Lecturer in Entomology.	1 July 1952 ..	20 July 1952.	Sri N. Raghava Rao.
Do.	21 July 1952 ..	15 Aug. 1952.	„ K. R. Nagarajan.
Do.	16 Aug. 1952 ..	18 Jan. 1953.	„ A. R. Seshadri.
Do.	19 Jan. 1953 ..	20 Feb. 1953.	„ C. S. Balasubramaniam, Lecturer in Entomology in additional charge.
Do.	21 Feb. 1953 ..	24 Sep. 1953.	„ A. R. Seshadri.
Lecturer in Botany	(Throughout.)		T. Venkataramana Rao.
Gazetted Assistant	Do.		B. Appala Naidu.
Lecturer in Civil Engineering.	1 July 1952 ..	25 June 1953.	„ T. Radhakrishnan.
Do.	26 June 1953 ..	30 June 1953.	„ M. Seshagiri Rao, Assistant Lecturer in additional charge.
Lecturer in Mechanical Engineering.	1 July 1952 ..	18 June 1953.	„ R. S. Subramaniam.
Do.	19 June 1953 ..	25 June 1953.	„ M. Seshagiri Rao, Assistant Lecturer in Civil Engineering in additional charge.
Plant Physiologist	1 July 1952 ..	24 Sep. 1952.	„ R. Balasubramaniam, Principal in additional charge.
Do.	25 Sep. 1952 ..	24 Sep. 1953.	Dr. P. Abraham.
Lecturer in Mycology ..	1 July 1952 ..	24 Sep. 1953.	Sri C. V. Govindaswamy.
Lecturer in Agricultural Economics.	1 July 1952 ..	3 Sep. 1952.	„ M. Srinivasan.
Do.	4 Sep. 1952 ..	1 Oct. 1952.	„ Md. Khasim Adeni, Senior Lecturer in Agriculture in additional charge.
Do.	2 Oct. 1952 ..	24 Sep. 1953.	Dr. M. Srinivasan.
Superintendent, College Farm, Bapatla.	(Throughout.)		Sri C. Hanumantha Rao.
RESEARCH SECTIONS.			
Paddy Section.			
Paddy Specialist	1 July 1952 ..	29 May 1953.	Sri M. B. Venkatanarasinga Rao.
Do.	30 May 1953 ..	30 June 1953.	„ A. Abdul Samad Assistant Paddy Specialist in additional charge.
Assistant Paddy Specialist, Coimbatore.	(Throughout.)		„ A. Abdul Samad.
Assistant Paddy Specialist, Pattambi.	Do.		„ P. Uttaman.
Agricultural Meteorologist, Coimbatore.	Do.		„ C. Balasubramaniam.
Cotton Section.			
Cotton Specialist	(Throughout.)		Sri S. M. Kalyanaraman.
Assistant Cotton Specialist, Coimbatore.	Do.		„ R. V. Rangaswamy.
Assistant Cotton Specialist, Tiruppur.	1 July 1952 ..	27 Nov. 1952.	„ G. R. Padaki.
Do.	28 Nov. 1952 ..	30 June 1953.	„ A. Raghavan.
Assistant Cotton Specialist, Srivilliputtur.	1 July 1952 ..	3 May 1953.	„ C. K. Ramachandran.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer-in-charge.
	From	To	
RESEARCH SECTIONS—cont.			
Cotton Section—cont.			
Assistant Cotton Specialist, Srivilliputtur—cont.	3 May 1953	2 June 1953	Sri P. N. Krishnaswamy, Cotton Certification Officer in additional charge.
Do.	3 June 1953	30 June 1953.	„ C. K. Ramachandran.
Assistant Cotton Specialist, Karunganni Scheme, Koilpatti.	1 July 1952	27 July 1952.	„ S. Mayandi Pillai, Assistant Cotton Specialist, K-2 and Co. 4 Scheme in additional charge.
Do.	28 July 1953	30 June 1953.	„ L. Neelakantan.
Assistant Cotton Specialist, K-2 and Co. 4 Scheme, Koilpatti.	(Throughout.)		„ S. Mayandi Pillai.
Assistant Cotton Specialist, Siruguppa.	1 July 1952	1 Aug. 1952.	„ K. Satyanarayamurthy, Assistant Cotton Specialist, Bellary, in additional charge.
Do.	2 Aug. 1952	18 Nov. 1952.	„ A. Raghavan.
Do.	19 Nov. 1952	16 Dec. 1952	„ K. Satyanarayamurthi, Assistant Cotton Specialist, Bellary, in additional charge.
Do.	17 Dec. 1952	26 Apr. 1953	„ N. G. Narayanan.
Do.	27 Apr. 1953	21 June 1953.	„ K. Satyanarayanamurthy, Assistant Cotton Specialist, Bellary, in additional charge.
Do.	22 June 1953	30 June 1953	„ N. G. Narayanan.
Assistant Cotton Specialist, Hagari, Bellary.	(Throughout.)		„ K. Satyanarayanamurthi.
Assistant Cotton Specialist, Cambodia Scheme, Coimbatore.	Do.		„ V. Ramaswamy Mudaliar.
Assistant Cotton Specialist, Narasaraopeta.	Do.		„ G. Seshadri Ayyangar.
Cotton Certification Officer, Rajapalayam.	1 July 1952	11 Jan. 1953.	„ P. N. Krishnaswamy.
Do.	12 Jan. 1953	28 Feb. 1953.	„ K. Kannian, Gazetted Assistant to Cotton Certification Officer in additional charge.
Do.	2 Mar. 1953	30 June 1953	„ P. N. Krishnaswami.
Gazetted Assistant to Cotton Certification Officer, Rajapalayam.	16 Dec. 1952	To date	„ K. Kannian.
Assistant Cotton Specialist, Nandyal.	1 July 1952	6 Feb. 1953	„ M. Venkoba Rao.
Do.	7 Feb. 1953	6 May 1953	„ A. Appa Rao, Cotton Assistant in additional charge.
Do.	7 May 1953	30 June 1953	„ M. Venkoba Rao.
Assistant Cotton Specialist, Guntur (Designation since changed as Assistant Research Officer in charge of Chillies Scheme and subsequently as Chillies Specialist).	1 July 1952	20 July 1952	„ L. Neelakandan.
Cotton Extension Officer, Coimbatore.	(Throughout.)		„ G. Jagannatha Rao.
Assistant Cotton Extension Officer, Coimbatore.	Do.		„ N. Kesava Iyengar.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in-charge.
	From	To	
RESEARCH SECTIONS—cont.			
Cotton Section—cont.			
(Throughout.)			Sri R. Krishnamurthi.
Assistant Cotton Extension Officer, Madurai. (Headquarters shifted from Koilpatti to Madurai on 17th July 1953.)	Do.		„ M. Subramania Chetty.
Assistant Cotton Extension Officer, Bellary.	1 July 1952	7 Dec. 1952	„ K. Kannian.
Assistant Cotton Extension Officer, Guntur.	8 Dec. 1952	30 June 1953	„ G. R. Padaki.
Do.			
Millet Section.			
Millet Specialist	1 July 1952	19 Jan. 1953	Sri P. Krishna Rao.
Do.	20 Jan. 1953	22 Apr. 1953	„ A. Kunhikoran Nambiyar.
Do.	23 Apr. 1953	30 June 1953	„ M. A. Sankara Ayyar, Assistant Millet Specialist in additional charge.
(Throughout.)			„ A. Kunhikoran Nambiar.
Assistant Millet Specialist, Coimbatore.	1 July 1952	17 Sep. 1952	„ V. Krishnaswami.
Assistant Millet Specialist, Coimbatore.	18 Sep. 1952	4 Nov. 1952	„ P. Krishna Rao, Millet Specialist in additional charge.
Do.	5 Nov. 1952	22 Apr. 1953	„ P. Krishnaswami.
Do.	23 Apr. 1952	30 June 1953	„ M. A. Sankara Ayyar.
Assistant Millet Specialist, Nandyal.	11 July 1952	8 Oct. 1952	„ P. Subramanyam.
Do.	9 Oct. 1952	26 Nov. 1952	„ A. V. Parthasarathy, Millet Assistant in additional charge.
Do.	27 Nov. 1952	1 May 1953	„ A. Subramaniam.
Do.	2 May 1953	8 June 1953	„ P. Krishnamurthy.
Do.	9 June 1953	20 June 1953	„ P. Subramaniam.
Oil-seeds Section.			
Oilseeds Specialist	1 July 1952	15 Oct. 1952	Sri G. Venkatanarayana.
Do.	16 Oct. 1952	15 Feb. 1953	„ C. R. Seshadri.
Do.	16 Feb. 1953	20 Mar. 1953	„ G. Venkatanarayana.
Do.	21 Mar. 1953	30 June 1953	„ C. R. Seshadri.
Assistant Oilseeds Specialist, Coimbatore.	1 July 1952	5 Jan. 1953	„ S. D. S. Albuquerque.
Do.	6 Jan. 1953	30 June 1953	„ S. G. Aiyadurai.
Assistant Oilseeds Specialist, Nucleus Seed Farm, Coimbatore.	1 July 1952	15 Oct. 1952	„ C. R. Seshadri.
Do.	16 Oct. 1952	5 Jan. 1953	„ S. G. Aiyadurai.
Do.	6 Jan. 1953	15 Feb. 1953	„ S. Varisai Muhammad.
Do.	16 Feb. 1953	20 Mar. 1953	„ C. R. Seshadri.
Do.	21 Mar. 1953	30 June 1953	„ S. Varisai Muhammad.
Superintendent, Agricultural Research Station, Tindivanam.	1 July 1952	14 Nov. 1952	„ M. Bhavanisankar Rao.
Do.	15 Nov. 1952	14 Dec. 1952	„ N. Srinivasalu, Assistant in additional charge.
Do.	15 Dec. 1952	30 June 1953	„ M. Bhavanisankar Rao.
Superintendent, Agricultural Research Station, Nileshtar.	(Throughout.)		„ P. M. Sayeed.
Cardamom Specialist	Do.		„ V. Gomathinayagam Pillai.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period.		Name of officer-in-charge.
	From	To	
RESEARCH SECTIONS—cont.			
Oil-Seeds Section—cont.			
Pepper Specialist	1 July 1952 ..	13 Sep. 1952	Sri Dr. P. Abraham.
Do.	14 Sep. 1952 ..	3 Apr. 1953	„ P. Govindakutty Kurup.
Do.	4 Apr. 1953 ..	8 May 1953	„ C. R. Seshadri, Oil-seeds Specialist in additional charge.
Do.	9 May 1953 ..	18 June 1953	„ P. C. Sahadevan, Assistant, Agricultural Research Station, Taliparamba, in additional charge.
Do.	19 June 1953 ..	30 June 1953	„ S. Govindakutty Kurup.
Pulses Section.			
Pulses Specialist	1 July 1952 ..	31 Mar. 1953	Sri M. A. Sankara Ayyar. (Post abolished from 1st April 1953).
Fruit Section.			
Fruit Specialist	(Throughout.)		Sri U. Narasinga Rao.
Assistant Fruit Specialist, Coimbatore.	1 July 1952 ..	24 Sep. 1953	„ K. Sambamurthy.
Assistant Fruit Specialist, Orchard-cum-Nurseries, Coimbatore.	1 July 1952 ..	13 Aug. 1952	„ V. S. Rangacharlu.
	14 Aug. 1952 ..	24 Sep. 1953	„ A. Subba Rao.
Assistant Fruit Specialist, Coonoor.	(Throughout.)		„ K. Fazlulla Khan.
Banana Research Officer, Aduthurai.	Do.		„ T. Gopalan Nair.
Assistant Fruit Specialist (Cashewnut Scheme), Mangalore.	22 June 1953 ..	To date	„ V. N. Madhava Rao.
Bio-Chemist, Kodur	1 July 1952 ..	13 Aug. 1952	„ C. Bhujanga Rao, Superintendent, Fruit Research Station, Kodur, in additional charge.
Do.	14 Aug. 1952 ..	25 Oct. 1952	Dr. R. Ramamurthy Reddi.
Do.	26 Oct. 1952 ..	11 Nov. 1952	Sri C. Bhujanga Rao, Superintendent, Fruit Research Station, Kodur, in additional charge.
Do.	12 Nov. 1952 ..	25 Feb. 1953	„ V. S. Rangacharlu, Superintendent, Fruit Research Station, Kodur in additional charge.
Do.	26 Feb. 1953 ..	20 Apr. 1953	Dr. R. Ramamurthy Reddi.
Do.	21 Apr. 1953 ..	30 June 1953	Sri V. S. Rangacharlu, Superintendent, Fruit Research Station, Kodur, in additional charge.
Botany Section.			
Systematic Botanist and Professor of Botany, Coimbatore.	1 July 1952 ..	5 Apr. 1953	Sri C. Rajasekara Mudaliar.
Do.	6 Apr. 1953 ..	30 June 1953	„ D. Daniel Sundararaj, Lecturer in Botany in additional charge.
Lecturer in Botany, Coimbatore.	(Throughout.)		„ D. Daniel Sundararaj.
Systematic Botanist, Aduthurai.	1 July 1952 ..	28 June 1953	„ T. Gopalan Nair, Banana Research Officer, in additional charge.
Do.	29 June 1953 ..	To date	„ J. Samuel Sundararaj.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer-in-charge.
	From	To	
RESEARCH SECTIONS—cont.			
Sugarcane Section.			
Sugarcane Specialist, Anakapalle.	1 July 1952 ..	8 June 1953	Sri S. V. Parthasarathy.
Do.	9 June 1953 ..	23 July 1953	„ M. Lakshmikantham, Assistant Agronomist in additional charge.
Assistant Agronomist, Agricultural Research Station, Anakapalle.	(Throughout.)		„ M. Lakshmikantham.
Assistant Mycologist, Anakapalle.	Do.		„ C. S. Krishnamurthy.
Assistant Physiologist, Anakapalle (post kept in abeyance from 21st May 1953).	1 July 1952 ..	20 May 1953	„ S. V. Parthasarathy, Sugarcane Specialist in additional charge.
Assistant Chemist	1 July 1952 ..	24 June 1953	„ N. Veera Mohan Rao.
Do.	25 June 1953 ..	4 Sep. 1953	„ R. L. Narasimhan, Assistant in Chemistry, in additional charge.
Assistant Entomologist	1 July 1952 ..	30 Oct. 1952	„ Muhammad Basheer.
Do.	31 Oct. 1952 ..	17 Nov. 1952	„ V. Tirumala Rao, Government Entomologist, in additional charge.
Do.	18 Nov. 1952 ..	30 June 1953	„ Muhammad Basheer.
Superintendent, Agricultural Research Station, Anakapalle.	1 July 1952 ..	8 Aug. 1952	„ C. S. Krishnamurthy, Assistant Mycologist in additional charge.
Do.	9 Aug. 1952 ..	12 Oct. 1952	„ A. Shanmugasundaram.
Do.	13 Oct. 1952 ..	30 June 1953	„ B. L. Narasimhamurthy.
Superintendents, Sugarcane Liaison Farms.			
Samalkot	(Throughout.)		Sri P. Seetharamiah.
Hospet	Do.		„ C. Ekambaram.
Nellikuppam	1 July 1952 ..	9 Apr. 1953	„ K. R. Sundaresan, Farm Manager (additional charge).
Do.	10 Apr. 1953 ..	30 June 1953	„ V. K. Appaji.
Kulittalai	1 July 1952 ..	31 May 1953	„ S. Ramaswami.
Do.	1 June 1953 ..	21 June 1953	„ P. S. Sanjeevi, Farm Manager, in charge.
Do.	22 June 1953 ..	30 June 1953	„ E. Jagannatha Rao.
Chemistry Section.			
Government Agricultural Chemist.	(Throughout)		Sri M. Sanyasi Raju.
Agricultural Bacteriologist	1 July 1952 ..	14 July 1952.	„ T. Rajagopala Ayyangar.
Do.	15 July 1952 ..	15 Oct. 1952.	„ M. Sanyasi Raju, Government Agricultural Chemist in additional charge.
Do.	16 Oct. 1952 ..	15 Dec. 1952.	„ T. Rajagopala Ayyangar.
Do.	16 Dec. 1952 ..	31 Dec. 1952.	„ M. Sanyasi Raju, Government Agricultural Chemist in additional charge.
Do.	1 Jan. 1953 ..	30 June 1953.	„ T. Rajagopala Ayyangar.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period.		Name of officer-in-charge.
	From	To	
RESEARCH SECTIONS—cont.			
Chemistry Section—cont.			
Soil Physicist	1 July 1952 ..	14 July 1952.	Sri F. L. Daniel.
Do.	15 July 1952 ..	15 Oct. 1952.	„ M. Sanyasi Raju, Govern- ment Agricultural Che- mist in additional charge.
Do.	16 Oct. 1952 ..	30 June 1953.	„ F. L. Daniel.
Soil Survey Officer, Coimba- tore.	1 July 1952 ..	17 Sep. 1952.	„ C. Raghavendrachari.
Assistant Agricultural Che- mist, Coimbatore.	1 July 1952 ..	22 July 1953.	„ D. V. Krishna Rao.
Do.	23 Feb. 1953 ..	28 Feb. 1953.	„ K. M. Krishna Menon.
Do.	1 Mar. 1953 ..	24 Sep. 1953.	„ D. V. Krishna Rao.
Do.	1 July 1952 ..	6 July 1952.	„ W. Thirumala Rao.
Do.	7 July 1952 ..	16 Apr. 1953.	„ T. S. Lakshmanan.
Do.	17 Apr. 1953 ..	12 May 1953.	Dr. A. Mariakulandai.
Do.	13 May 1953 ..	30 June 1953.	Sri G. K. Chidambaram.
Assistant Agricultural Che- mist, Malt Factory (Post abolished from 31st Jan- uary 1953).	1 July 1953 ..	31 Jan. 1953.	„ K. M. Krishna Menon.
Assistant Agricultural Che- mist, Tanjore.	1 July 1952 ..	24 Sep. 1952.	„ P. Kunhirama Menon.
Do.	25 Sep. 1952 ..	To date ..	„ C. Raghavendrachar.
Entomology Section.			
Government Entomologist ..	1 July 1952 ..	4 July 1952.	Sri V. Thirumala Rao.
Do.	5 July 1952 ..	8 Aug. 1952.	„ S. Ramachandran.
Do.	7 Aug. 1952 ..	24 Sep. 1953.	„ V. Thirumala Rao.
Assistant Entomologist, Coimbatore.	1 July 1952 ..	6 Aug. 1952.	„ A. R. Seshadri.
Do.	7 Aug. 1952 ..	30 June 1953.	„ S. Kanakaraj David.
Assistant Entomologist, Fern- hill (post abolished from 1 August 1952).	1 July 1952 ..	31 July 1952.	„ P. S. Narayanaswamy.
Mycology Section.			
Agriculturists	(Throughout)		Sri M. S. Subbaiah.
Government Mycologist.	Do.	..	„ T. S. Ramakrishnan.
Assistant Mycologist ..	Do.	..	„ C. S. Krishnaswamy.
Assistant Mycologist, Ootaca- mund.	Do.	..	„ K. V. Srinivasan.
Agricultural Research Engineering Section.			
Assistant Agricultural Engi- neer (Research).	(Throughout)	..	Sri J. P. Walter Devasahayam.
Gazetted Assistant to Assis- tant Agricultural Engineer, (Research)	Do.	..	„ R. Govinda Menon.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
RESEARCH SECTIONS—cont.			
Crop and Plant Protection Officers.			
Crop and Plant Protection Officer (Entomology), Bapatla.	1 July 1952	12 July 1952.	Sri K. R. Nagarajan.
Do.	13 July 1952	1 Aug. 1952.	„ V. Tirumala Rao.
Do.	2 Aug. 1952	16 Aug. 1952.	„ P. Govinda Rao, Crop and Plant Protection Officer (Mycology), additional charge.
Do.	17 Aug. 1952	1 Sep. 1952.	„ K. R. Nagarajan.
Do.	2 Sep. 1952	30 June 1953.	„ N. Raghava Rao.
Crop and Plant Protection Officer (Mycology), Bapatla.	(Throughout)		„ P. Govinda Rao.
Crop and Plant Protection Officer (Entomology), Coimbatore.	Do.		„ E. R. Gopala Menon.
Crop and Plant Protection Officer (Mycology), Coimbatore.	1 July 1952	24 July 1952.	„ K. Krishna Menon.
Do.	25 July 1952	25 July 1952.	„ E. R. Gopala Menon, Crop and Plant Protection Officer (Entomology), in additional charge.
Do.	26 July 1952	30 June 1953.	„ N. Ramesh Adyanthaya.
DISTRICTS.			
Visakhapatnam Division.			
Deputy Director of Agriculture, Visakhapatnam.	1 July 1952	4 Sep. 1952.	Sri K. Venkataraman.
Do.	5 Sep. 1952	12 Feb. 1953.	„ T. S. Francis.
Do.	13 Feb. 1953	21 Sep. 1953.	„ A. Muhammad Ali.
District Agricultural Officer, Srikakulam.	1 July 1952	4 Sep. 1952.	„ Baghirathi Padhy.
Do.	5 Sep. 1952	10 Dec. 1952.	„ P. Somayajulu.
Do.	11 Dec. 1952	26 June 1953.	„ J. H. S. Ponnayya.
Do.	27 June 1952	10 July 1953.	„ K. Rama Rao, Personal Assistant, in additional charge.
District Agricultural Officer, Anakapalle.	1 July 1952	14 Apr. 1953.	„ M. Ramamurthi.
Do.	15 Apr. 1953	27 Apr. 1953.	„ K. C. Thomas.
Do.	28 Apr. 1953	8 May 1953.	„ V. V. Jagannatha Rao, Personal Assistant, in additional charge.
Do.	9 May 1953	17 May 1953.	„ B. Seshavatharam, Plant Protection Assistant (Mycology), in additional charge.
Do.	18 May 1953	24 June 1953.	„ K. C. Thomas.
Do.	25 June 1953	30 July 1953.	„ G. V. Raghavelu, Personal Assistant, in additional charge.

Appointments, postings and transfers of Gazetted Officers—cont.

Post,	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Viskhapatnam Division—cont.			
Special District Agricultural Officer, Araku Valley.	1 July 1952 ..	11 Dec. 1952.	Sri K. Bhushanam.
Do.	12 Dec. 1952 ..	21 Dec. 1952.	„ Muhammad Zainulabdeen, Farm Manager, in additional charge.
Do.	22 Dec. 1952 ..	To date ..	„ G. V. Ratnam.
Assistant Agricultural Engineer, Anakapalle.	(Throughout)		„ Y. Hanumantha Rao.
Sugarcane Inspector, Visakhapatnam.	23 Dec. 1952 ..	10 Feb. 1953.	„ M. Vaidyanathan.
Do.	11 Feb. 1953 ..	21 June 1953.	„ T. N. Balasubramaniam.
Do.	22 June 1953 ..	16 July 1953.	„ A. Muhammad Ali, Deputy Director of Agriculture, Visakhapatnam, in additional charge.
Eluru Division.			
Deputy Director of Agriculture, Eluru.	(Throughout)		Sri M. Satyanarayana.
District Agricultural Officer, Eluru.	1 July 1952 ..	3 Sep. 1952.	„ B. Santhanakrishnan.
Do.	4 Sep. 1952 ..	13 Apr. 1953.	„ D. Hanumantha Rao.
Do.	14 Apr. 1953 ..	1 May 1953.	„ M. V. Bhaskara Rao, Personal Assistant, in additional charge.
Do.	2 May 1953 ..	To date ..	„ D. Hanumantha Rao.
District Agricultural Officer, Kakinada.	1 July 1952 ..	12 Apr. 1953.	„ K. Veerabhadra Rao.
Do.	13 Apr. 1953 ..	3 May 1953.	„ A. Subramaniam, Personal Assistant, in additional charge.
Do.	4 May 1953 ..	17 July 1953.	„ K. Veerabhadra Rao.
Superintendent, Agricultural Research Station, Samalkot.	(Throughout)		„ Syed Ibrahim.
Superintendent, Agricultural Research Station, Maruteru.	Do.		„ N. H. V. Krishnamurthi.
District Agricultural Officer, Vijayavada.	1 July 1952 ..	19 June 1953.	„ M. Satyanarayanamurthy.
Do.	20 June 1953 ..	22 June 1953.	„ D. Sridhara Sastry, Personal Assistant, in additional charge.
Do.	23 June 1953 ..	To date ..	„ K. Bhushanam.
Seed Development Officer (Paddy), Kakinada.	(Throughout)		„ K. B. Viswanadhan.
Additional District Agricultural Officer (Manuring Scheme), Kakinada.	1 July 1952 ..	30 Nov. 1952.	„ G. Ranganadhaswamy.
Do.	(Post abolished from 1 Dec. 1952.)		
Additional District Agricultural Officer (Manuring Scheme), Eluru.	10 May 1953 ..	To date ..	„ V. V. Jaganatha Rao.
Do.	1 July 1952 ..	28 July 1952.	„ P. Somayajulu.
Do.	29 July 1952 ..	3 Sep. 1952.	„ D. Hanumantha Rao.
Do.	4 Sep. 1952 ..	19 Oct. 1952.	„ K. Raghunatha Reddi.
Do.	20 Oct. 1952 ..	30 Nov. 1952.	„ N. V. Kalyanasundaram.
Do.	(Post abolished from 1 Dec. 1952.)		
Do.	16 Mar. 1953 ..	To date ..	„ P. Somayajulu.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Eluru Division—cont.			
Additional District Agricultural Officer (Manuring Scheme), Vijayavada.	1 July 1952 ..	30 Nov. 1952.	Sri K. C. Thomas.
Do.	(Post abolished from 1 Dec. 1952.)		
Special District Agricultural Officer (Crop Sampling), Kakinada.	11 May 1953 ..	To date ..	„ Muhammad Zainulabdeen.
Special District Agricultural Officer (Crop Sampling), Vijayavada.	(Throughout)		„ M. Somayya.
Do.	1 July 1952 ..	7 July 1952.	„ M. Satyanarayanamurthy, District Agricultural Officer, Vijayavada (additional charge).
Do.	8 July 1952 ..	16 July 1952.	„ T. Devasikhamani.
Do.	17 July 1952 ..	9 Aug. 1952.	„ K. Raghunatha Reddi.
Do.	10 Aug. 1952 ..	24 July 1953.	„ V. Rama Rao.
Assistant Agricultural Engineer (Inspection), Vijayavada.	(Throughout)		„ C. Kamalarathnam.
Guntur Division.			
Deputy Director of Agriculture, Guntur.	(Throughout)		Sri T. Rangabrahma Rao.
District Agricultural Officer, Guntur.	1 July 1952 ..	2 July 1952.	„ P. L. Narasimham.
Do.	3 July 1952 ..	10 July 1952.	„ M. Vaidyanathan, Additional District Agricultural Officer, in additional charge.
Do.	11 July 1952 ..	1 Dec. 1952.	„ A. K. Annaswami Ayyar.
Do.	2 Dec. 1952 ..	16 Mar. 1953.	„ N. V. Kalyanasundram.
Do.	17 Mar. 1953 ..	14 Apr. 1953.	„ G. Ranganadhaswami.
Do.	15 Apr. 1953 ..	1 May 1953.	„ D. Satyanarayana, Personal Assistant, in additional charge.
Do.	2 May 1953 ..	23 July 1953.	„ G. Ranganadhaswami.
District Agricultural Officer, Nellore.	1 July 1952 ..	8 Dec. 1952.	„ G. V. Ratnam.
Do.	9 Dec. 1952 ..	9 Apr. 1953.	„ L. Krishnan.
Do.	10 Apr. 1953 ..	9 May 1953.	„ P. Somayajulu.
Do.	10 May 1953 ..	26 May 1953.	„ L. Krishnan.
Do.	27 June 1953 ..	14 July 1953.	„ V. Kumaraswami, Additional District Agricultural Officer, in additional charge.
District Agricultural Officer, Kurnool.	1 July 1952 ..	29 Apr. 1953.	„ M. Jeevan Rao.
Do.	30 Apr. 1953 ..	17 May 1953.	„ B. Ramakrishna Reddi, Personal Assistant, in additional charge.
Do.	18 May 1953 ..	To date ..	„ M. Jeevan Rao.
Additional District Agricultural Officer (Manuring Scheme), Guntur.	1 July 1952 ..	30 Nov. 1952.	„ M. Vaidyanathan.
Do.	(Post abolished from 1 Dec. 1952.)		
Additional District Agricultural Officer (Manuring Scheme), Nellore.	15 May 1953 ..	To date ..	„ M. Rami Reddi.
Do.	1 July 1952 ..	30 Nov. 1952.	„ M. J. David.
Do.	(Post abolished from 1 Feb. 1952.)		
Assistant Agricultural Engineer (Tractor Workshop), Bapatla.	4 June 1953 ..	To date ..	„ V. Kumaraswami.
Chillies Specialist, Agricultural Research, Station Lam, Guntur.	(Throughout)		„ C. Seetharamiah.
Do.	21 July 1952 ..	22 Oct. 1952.	„ V. Srinivasan,
Do.	23 Oct. 1952 ..	31 July 1953.	„ M. P. Narasimha Rao.

APPENDICES

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Cuddapah Division.			
Deputy Director of Agriculture, Cuddapah.	1 July 1952 ..	26 Apr. 1953 ..	Sri Md. Obeidullah Shah.
Do.	27 Apr. 1953 ..	3 May 1953 ..	„ G. Sakharama Rao, Deputy Director of Agriculture, Vellore, in additional charge.
Do.	4 May 1953 ..	To date ..	„ Mirza Anser Baig.
District Agricultural Officer, Cuddapah.	1 Mar. 1952 ..	1 July 1952 ..	„ A. K. Annaswami Iyer.
Do.	2 July 1952 ..	7 Apr. 1953 ..	„ T. Krishna Reddi.
Do.	8 Apr. 1953 ..	24 Sep. 1953 ..	„ A. K. Annaswami Iyer.
District Agricultural Officer, Chittoor.	1 July 1952 ..	30 Apr. 1953 ..	„ E. G. Sivaswami.
Do.	1 May 1953 ..	15 May 1953 ..	„ K. Venkatramiah, Personal Assistant, in additional charge.
Do.	16 May 1953 ..	9 June 1953 ..	„ E. G. Sivaswami.
Do.	10 June 1953 ..	21 June 1953 ..	„ Ch. Venkatachalam.
District Agricultural Officer, Anantapur.	22 June 1953 ..	24 Sep. 1953 ..	„ R. Alagiamanavalan.
District Agricultural Officer, Bellary.	(Throughout)		„ A. B. Adishesha Reddi.
Special District Agricultural Officer, Tungabhadra Project.	Do.		„ K. Subba Rao.
Seed Development Officer (Millets), Bellary.	Do.		„ K. Rama Rao.
Special District Agricultural Officer (Crop Sampling), Bellary.	Do.		„ G. Ramabhadran.
Do.	1 July 1952 ..	2 May 1953 ..	„ Mirza Anser Baig.
Superintendent, Agricultural Research Station, Hagari.	3 May 1953 ..	To date ..	„ T. Deivasikhamani.
Assistant Agricultural Engineer (Contour Bunding), Bellary.	(Throughout)		„ S. Ramachandra Rao.
Do.	1 July 1952 ..	24 July 1953 ..	„ N. Sankaranarayana Reddi.
Do.	25 May 1953 ..	13 June 1953 ..	„ K. Raghunatha Reddi, Soil Conservation Assistant, in additional charge.
Do.	14 June 1953 ..	24 Sep. 1953 ..	„ N. Sankaranarayana Reddi.
Assistant Agricultural Engineer (Inspection), Bellary.	1 July 1952 ..	15 May 1953 ..	„ T. S. Palanivelu.
Do.	16 May 1953 ..	14 July 1953 ..	„ P. Rajavadan, Assistant Agricultural Engineer (Tractor Workshop), Bellary, in additional charge.
Assistant Agricultural Engineer (Tractor Workshop), Bellary.	17 Dec. 1952 ..	9 June 1953 ..	„ P. Rajavadan.
Do.	10 June 1953 ..	2 July 1953 ..	„ S. Sriramamurthi, Assistant Agricultural Engineer, in additional charge.
Agronomist, Siruguppa	(Throughout)		„ S. Rajarathnam Chetty.
Superintendent, Fruit Research Station, Kodur.	1 July 1952 ..	11 Nov. 1952 ..	„ C. Bhujanga Rao.
Do.	12 Nov. 1952 ..	To date ..	„ V. S. Rangacharlu.
Assistant Agricultural Engineer (Soil Conservation), Chittoor.	1 July 1952 ..	26 Aug. 1952 ..	„ S. Narayanaswami, Assistant Agricultural Engineer (Soil Conservation), Ootacamund, in additional charge.
Do.	27 Aug. 1952 ..	24 Sep. 1953 ..	„ C. R. Shanmugam.
Assistant Agricultural Engineer Pilot Scheme, Bellary.	29 May 1953 ..	To date ..	„ P. Rajavadhan.

APPENDICES

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Vellore Division.			
(Throughout)			Sri G. Sakharama Rao.
Deputy Director of Agriculture, Vellore.	1 July 1952 ..	8 Dec. 1952 ..	„ R. Alagiamanavalan.
District Agricultural Officer, Vellore.	9 Dec. 1952 ..	To date ..	„ S. V. Ramachandran.
Do.	(Throughout)		„ K. L. Ramakrishna Rao.
District Agricultural Officer, Guindy.	1 July 1952 ..	30 Apr. 1953 ..	„ S. M. Sulaiman.
District Agricultural Officer, Salem.	1 May 1953 ..	15 May 1953 ..	„ M. S. Sethuraman, Personal Assistant, in additional charge.
Do.	16 May 1953 ..	31 May 1953 ..	„ S. M. Sulaiman.
Do.	1 June 1953 ..	23 June 1953 ..	„ B. P. Masillamani.
Do.	24 June 1953 ..	To date ..	„ N. Krishna Pillai.
Superintendent, Agricultural Research Station, Tirurkuppam.	(Throughout)		„ M. K. Venkatasubramaniam.
Seed Development Officer (Paddy), Vellore.	Do.		„ N. C. Thirumalacharya.
Assistant Agricultural Engineer (Inspection), Vellore.	1 July 1952 ..	31 Mar. 1953 ..	„ A. K. Subramaniam.
Do.	1 June 1953 ..	13 June 1953 ..	„ K. E. Narayana, Agricultural Engineering Supervisor, in additional charge.
Do.	14 June 1953 ..	To date.	„ A. K. Subramaniam.
Tanjore Division.			
(Throughout)			Sri K. Varadachari.
Deputy Director of Agriculture, Tanjore.	1 July 1952 ..	14 June 1953 ..	„ K. Krishnan.
District Agricultural Officer, Tanjore.	15 June 1953 ..	To date ..	„ K. V. Kalyanasundaram.
Do.	1 July 1952 ..	28 Dec. 1952 ..	„ U. B. Muhammad Abbas.
District Agricultural Officer, Pattukkottai.	29 Dec. 1952 ..	To date ..	„ H. J. David.
Do.	1 July 1952 ..	21 Oct. 1952 ..	„ A. Ramadoss.
District Agricultural Officer, Cuddalore.	22 Oct. 1952 ..	15 Apr. 1953 ..	„ S. Muthuswami Ayyar.
Do.	16 Apr. 1953 ..	1 May 1953 ..	„ T. D. Muthuswami, Personal Assistant, in additional charge.
Do.	2 May 1953 ..	To date ..	„ S. Muthuswami Ayyar.
Sugarcane Inspector, Pugalur.	14 July 1952 ..	9 Oct. 1952 ..	„ N. V. Kalyanasundaram.
District Agricultural Officer, Tiruchirappalli.	1 July 1952 ..	26 Aug. 1952 ..	„ T. S. Francis.
Do.	27 Aug. 1952 ..	30 Nov. 1952 ..	„ J. H. S. Ponnayya.
Do.	1 Dec. 1952 ..	To date ..	„ K. H. Subramania Ayyar.
Additional District Agricultural Officer (Manuring Scheme), Tanjore.	1 July 1952 ..	9 July 1952 ..	„ K. Raghunatha Reddi.
Do.	10 July 1952 ..	30 Nov. 1952.	„ K. S. Krishnamurthi.
Do.	(Post abolished from 1 Dec. 1951.)		„ G. Venkatakrishnan.
Do.	3 June 1953 ..	26 June 1953 ..	„ N. V. Kalyanasundaram,
Do.	27 June 1953 ..	26 July 1953 ..	„ District Agricultural Officer, in additional charge.
Additional District Agricultural Officer (Manuring Scheme), Tiruchirappalli.	1 July 1952 ..	30 Nov. 1952 ..	„ K. H. Subramania Iyer.
	(Post abolished from 1 Dec. 1952.)		

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Tanjore Division—cont.			
Additional District Agricultural Officer (Manuring Scheme), Pattukkottai.	1 July 1952	30 Nov. 1952.. (Post abolished from 1 Dec. 1952.)	Sri L. Krishnan.
Do.	8 June 1952	30 June 1953..	„ P. K. Nambiar.
Special District Agricultural Officer (Crop Sampling), Tanjore.	1 July 1952	28 June 1953..	„ P. S. Venkatasubra maniam.
Do.	29 June 1953	26 July 1953.. (Throughout)	„ M. Vaidyanathan. „ M. Rayappa Pillai.
Superintendent, Agricultural Research Station, Palur.	Do.	..	„ K. Ramaswamy.
Superintendent, Agricultural Research Station, Aduthurai.	1 July 1952	15 Sep. 1952..	„ R. Govindaramiah.
Seed Development Officer (Paddy), Tanjore.	16 Sep. 1952	21 Sep. 1952..	„ K. Krishnan, District Agricultural Officer, Tanjore, in additional charge.
Do.	22 Sep. 1952	To date (Throughout)	„ V. Krishnaswami. „ C. R. Subramanian.
Assistant Agricultural Engineer (Inspection), Tiruchirappalli.	1 July 1952	10 Dec. 1952.. (Post abolished from 10 Dec. 1952, a.n.)	„ K. Natarajan.
Assistant Agricultural Engineer (Tube Wells Scheme), Mayavaram.	Madurai Division.		
Deputy Director of Agriculture, Madurai.	1 July 1952	2 Feb. 1953..	Sri A. Mohammed Ali.
Do.	3 Feb. 1953	22 Feb. 1953..	„ K. Varadhachari, De- puty Director of Agri- culture, Tanjore, in additional charge.
Do.	23 Feb. 1953	3 May 1953..	„ T. S. Francis.
Do.	4 May 1953	20 July 1953..	„ Muhammad Obeidullah Shah.
District Agricultural Officer, Madurai.	1 July 1952	16 Mar. 1953..	„ N. Krishna Pillai.
Do.	17 Mar. 1953	16 June 1953..	„ R. Anantapadmanabha Pillai.
Do.	17 June 1953	26 June 1953..	„ A. Krishnaswami Iyer, Personal Assistant, in additional charge.
Do.	27 June 1953	6 Sep. 1953..	„ K. S. Krishnamurthi.
District Agricultural Officer, Sattur.	1 July 1952	14 Apr. 1953..	„ N. S. Rajagopalan.
Do.	15 Apr. 1953	30 Apr. 1953..	„ T. K. Sankarasubra- maniam, Personal Assistant, in additional charge.
Do.	1 May 1953	26 June 1953..	„ N. S. Rajagopalan.
Do.	27 June 1953	To date	„ A. K. Ramasubba Ayyar.
District Agricultural Officer, Tirunelveli.	1 July 1952	23 Apr. 1953..	„ A. K. Ramasubba Iyer.
Do.	24 Apr. 1953	30 Apr. 1953..	„ K. Sundaram Pillai, Plant Protection Assis- tant (Mycology), in additional charge.
Do.	1 May 1953	24 June 1953..	„ A. K. Ramasubba Ayyar.
Do.	25 June 1953	30 June 1953..	„ K. Sundaram Pillai, Plant Protection Assis- tant (Mycology), in additional charge.
Superintendent, Agricultural Research Station, Koilpatti.	(Throughout)		„ B. W. X. Ponniah.
Additional District Agricultural Officer (Manuring Scheme), Madurai.	1 July 1952	30 Nov. 1952.. (Post abolished from 1 Dec. 1952.)	„ T. N. Balasubramanian.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Madurai Division—cont.			
Additional District Agricultural Officer (Manuring Scheme), Tirunelveli.	2 July 1952	30 Nov. 1952 .. (Post abolished from 1 Dec. 1952.)	Sri S. V. Ramachandran.
Special District Agricultural Officer (Crop Sampling), Madurai.	(Throughout)		„ K. V. Natesa Ayyar.
Sugarcane Inspector, Madurai.	1 July 1952	13 Oct. 1952 ..	„ S. Muthuswamy Ayyar.
Assistant Agricultural Engineer (Inspection), Madurai.	(Throughout)		„ C. S. Sreedharan.
Coimbatore Division.			
Deputy Director of Agriculture, Coimbatore.	1 July 1952	12 Oct. 1952 ..	Sri P. A. Venkateswara Ayyar.
Do.	13 Oct. 1952	To date ..	„ S. S. Katchapeswaran.
District Agricultural Officer, Coimbatore.	1 July 1952	12 Sep. 1952 ..	„ M. Mukundan.
Do.	30 Sep. 1952	30 Apr. 1953 ..	„ B. Santhanakrishnan.
Do.	1 May 1953	15 May 1953 ..	„ M. Kasiviswanathan, Personal Assistant, in additional charge.
Do.	16 May 1953	7 July 1953 .. (Throughout)	„ B. Santhanakrishnan. „ K. Sanjiva Shetty.
District Agricultural Officer, Tellicherry.	1 July 1952	14 Aug. 1952 ..	„ N. Srinivasa Rao.
District Agricultural Officer, Shoranur.	15 Aug. 1952.	17 Aug. 1952 ..	„ P. A. Venkateswara Ayyar, Deputy Director of Agriculture, Coimbatore, in additional charge.
Do.	18 Aug. 1952.	29 Apr. 1953 ..	„ P. K. Parameswara Menon.
Do.	30 Apr. 1953.	16 May 1953 ..	„ K. V. Govinda Nair, Personal Assistant, in additional charge.
Do.	17 May 1953.	14 June 1953 ..	„ P. K. Parameswara Menon.
Do.	15 June 1953 ..	18 June 1953 ..	„ C. S. Sankaranarayana Ayyar, Personal Assistant, in additional charge.
Do.	17 June 1953 ..	To date ..	„ K. Krishnan.
District Agricultural Officer, Mangalore.	1 July 1952 ..	9 Nov. 1952 ..	„ K. S. Ramanna Rai.
Do.	10 Nov. 1952.	31 Jan. 1953 ..	„ R. Anantapadmanabha Pillai.
Do.	1 Feb. 1953 ..	10 Apr. 1953 ..	„ K. S. Ramanna Rai.
Do.	11 Apr. 1953.	To date ..	„ P. N. Nayar.
Do.	1 July 1952 ..	5 Apr. 1953 ..	„ P. N. Nayar.
District Agricultural Officer, Ootacamund.	6 Apr. 1953 ..	To date ..	„ M. Mukundan.
Do.	1 July 1952 ..	26 July 1952 ..	„ P. N. Nayar, District Agricultural Officer, Ootacamund, in additional charge.
Curator, Government Botanical Gardens, Ootacamund.	27 July 1952.	15 Feb. 1953 ..	„ B. G. Narayana Menon
Do.	16 Feb. 1953.	27 Feb 1953 ..	<i>Vacant.</i>
Do.	28 Feb. 1953.	7 Mar. 1953 ..	„ P. N. Nayar, District Agricultural Officer, Ootacamund, in additional charge.
Do.	8 Mar. 1953 ..	To date ..	„ B. G. Narayana Menon.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period		Name of officer in charge.
	From	To	
DISTRICTS—cont.			
Coimbatore Division—cont.			
(Throughout)			
Special District Agricultural Officer (Crop Sampling). Headquarters shifted from Coimbatore to Salem from 16 Aug. 1952.			Sri K. Raman Menon.
Special District Agricultural Officer (Crop Sampling), Shoranur.	Do.		„ P. P. Syed Mohammad
Superintendent, Agricultural Research Station, Nanjanad.	Do.		„ K. Saphtharishi.
Superintendent, Wynaad Colonization Scheme.	1 July 1952 ..	7 Sep. 1952 ..	„ P. Govindakutty Kurup
Do.	8 Sep. 1952 ..	21 Nov. 1952 ..	„ P. K. Nambiar, Farm Manager, in additiona charge.
Do.	22 Nov. 1952.	30 June 1953 ..	„ C. Bhujanga Rao.
Superintendent, Agricultural Research Station, Mangalore.	(Throughout)		„ K. Hanumantha Rao.
Seed Development Officer (Millets), Coimbatore.	Do.		„ U. Achutha Warriar.
Assistant Agricultural Engineer (Soil Conservation), Ootacamund.	Do.		„ S. Narayanaswami.
Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	Do.		„ M. Umapathy.
Assistant Agricultural Engineer for Groundnut Machinery Scheme at Coimbatore.	22 June 1953.	30 June 1953 ..	„ A. H. Muhammad Ali.
Agronomist, Agricultural Research Station, Satyamangalam.	18 Sep. 1952..	31 Mar. 1953 ..	„ M. Mukundan.
Do.	1 Apr. 1953 ..	To date ..	„ S. Sundaram.

OFFICERS WHO WERE ON LEAVE.

Name and designation.	Period		Remarks.
	From	To	
Sri C. K. Ramachandran, Assistant Cotton Specialist, Srivilliputtur.	3 May 1953 ..	2 June 1953.	
„ R. Ananthapadmanabha Pillai, District Agricultural Officer.	10 Mar. 1952 ..	9 Nov. 1952.	
Do.	1 Feb. 1953 ..	8 Mar. 1953.	
„ C. Annamalai, Special Officer for Propaganda, Board of Revenue (Civil Supplies).	18 Aug. 1952 ..	25 Nov. 1952.	
„ V. K. Appaji, Superintendent, Agricultural Research Station, Anakapalle.	6 Mar. 1952 ..	5 Apr. 1953.	
„ S. G. Aiyadurai, Assistant Oil Seeds Specialist, Nucleus Seed Farm, Coimbatore.	1 Oct. 1952 ..	15 Oct. 1952.	

OFFICERS WHO WERE ON LEAVE—cont.

Name and designation.	Period		Remarks.
	From	To	
Sri M. R. Balakrishnan, Lecturer in Chemistry.	1 Nov. 1952 ..	28 Feb. 1953.	
„ C. S. Balasubramanian, Lecturer in Entomology, Bapatla.	21 July 1952 ..	31 Aug. 1952.	
„ M. Bhavanisankar Rao, Superintendent, Agricultural Research Station, Tindivanam.	15 Nov. 1952 ..	14 Dec. 1952.	
„ G. K. Chidambaram, Assistant Agricultural Chemist.	13 Jan. 1953 ..	12 May 1953.	
„ T. S. Francis, District Agricultural Officer.	4 May 1953 ..	2 July 1953.	
„ P. Govindakutty Kurup, Pepper Specialist, Taliparamba.	4 Apr. 1953 ..	18 June 1953.	
„ C. M. John, Principal, Agricultural College, on foreign service under the Indian Central Coconut Committee.	23 Apr. 1953 ..	9 May 1953.	
„ P. D. Karunakar, Principal, Agricultural College, Bapatla.	30 Mar. 1953 ..	29 July 1953.	
„ S. S. Katchapieswaran, Deputy Director of Agriculture.	11 June 1952 ..	12 Oct. 1952.	
„ K. M. Krishna Menon, Assistant Agricultural Chemist in charge, Malt Factory.	1 Feb. 1953 ..	22 Feb. 1953 ..	Leave on reversion.
„ C. Krishnamurthi, Agricultural Engineer (Civil Supplies), Vijayavada.	22 Jan. 1953 ..	13 Feb. 1953.	
„ T. Krishna Reddy, District Agricultural Officer.	17 Apr. 1952 ..	1 July 1952.	
„ K. S. Krishnamurthi, District Agricultural Officer.	10 Mar. 1952 ..	9 July 1952.	
„ U. B. Muhammad Abbas, District Agricultural Officer.	9 Apr. 1953 ..	16 July 1953.	
„ Muhammad Basheer, Assistant Entomologist, Coimbatore.	31 Oct. 1952 ..	17 Nov. 1952.	
„ Muhammad S. M. Sulaiman, District Agricultural Officer.	1 June 1953 ..	29 Aug. 1953.	
„ M. Narasimham, Junior Lecturer, Bapatla.	16 Oct. 1951 ..	21 July 1952.	
„ P. L. Narasimham, District Agricultural Officer, Guntur.	6 Jan. 1953 ..	5 Aug. 1953.	
„ T. S. Palanivelu, Assistant Agricultural Engineer (Inspection), Bellary.	3 July 1952 ..	14 Nov. 1952 ..	Invalidated from service from 15 Nov. 1952.
„ S. V. Parthasarathy, Sugarcane Specialist, Anakapalle.	18 May 1953 ..	14 July 1953.	
„ T. Radhakrishnan, Lecturer in Civil Engineering, Bapatla.	9 June 1953 ..	23 July 1953.	
„ T. Rajagopala Ayyangar, Agricultural Bacteriologist, Coimbatore.	26 June 1953 ..	25 July 1953.	
„ C. Rajasekhara Mudaliar, Systematic Botanist and Professor of Botany, Coimbatore.	16 Dec. 1952 ..	31 Dec. 1952.	
	8 Apr. 1953 ..	30 June 1953.	

OFFICERS WHO WERE ON LEAVE—cont.

Name and designation.	Period.		Remarks.
	From	To	
Sri S. Ramachandran, Government Entomologist, Coimbatore.	31 May 1952 ..	4 July 1952.	
" M. Ramamurthi, District Agricultural Officer, Anakapalle.	15 Apr. 1953 ..	15 July 1953...	
" V. Rama Rao, Special District Agricultural Officer (Crop Sampling), Kakinada. (Now Deputy Director of Agriculture, Visakhapatnam).	4 May 1952 ..	1 Aug. 1952.	
" K. S. Ramanna Rai, District Agricultural Officer, Mangalore.	10 Nov. 1952 ..	31 Jan. 1953.	
" S. Ramaswami Ayyar, Superintendent, Sugarcane Liaison Farm, Kulittalai.	2 June 1953 ..	11 Sep. 1953.	
" K. Ramaswamy Ayyar, Superintendent, Central Farm, Coimbatore.	31 Oct. 1952 ..	30 Dec. 1952.	
" N. C. Narayanan, Assistant Cotton Specialist.	8 Oct. 1952 ..	6 Dec. 1952.	
" V. S. Rangachari, Assistant Fruit Specialist.	27 Apr. 1953 ..	21 June 1953.	
	14 Aug. 1952 ..	11 Nov. 1952.	
" M. A. Sankara Ayyar, Pulses Specialist (now Assistant Millet Specialist, Coimbatore).	1 Apr. 1953 ..	22 Apr. 1953.	Leave on abolition of the post of pulses Specialist.
" P. N. Krishnaswamy, Cotton Certification Officer, Rajapalayam.	12 Jan. 1953 ..	28 June 1953.	
" N. Sankaranarayana Reddi, Assistant Agricultural Engineer (Contour Bunding Scheme, Bellary).	25 May 1953 ..	13 June 1953.	
" K. Santhanam, Special District Agricultural Officer (Crop Sampling), Madras.	31 May 1952 ..	18 Aug. 1952.	
" V. Satagopan, Deputy Director of Agriculture (now State Marketing Officer, Madras).	7 Nov. 1952 ..	19 Jan. 1953.	
" C. R. Seshadri, Oil seeds Specialist, Coimbatore.	1 July 1952 ..	30 Sep. 1952.	
" A. R. Seshadri, Lecturer in Entomology.	19 Jan. 1953 ..	20 Feb. 1953.	
" E. G. Sivasami, District Agricultural Officer.	10 June 1953 ..	20 July 1953.	
" V. T. Subbiah Mudaliar, Agronomist and Professor of Agriculture, Coimbatore.	10 Oct. 1952 ..	26 Dec. 1952 ..	Leave preparatory to retirement.
" R. S. Subramaniam, Lecturer in Mechanical Engineering, Bapatla.	19 June 1953 ..	18 July 1953.	
" A. H. Subramani, Sarma, Lecturer in Agriculture, Coimbatore.	10 Dec. 1952 ..	17 Dec. 1952.	
" S. Sundaram, Agronomist, Coffee Board (now at Agricultural Research Station, Satyamangalam.)	20 June 1952 ..	21 July 1952.	
	1 Dec. 1952 ..	23 Mar. 1953.	Leave on reversion from the Coffee Board.
" V. Suryanarayana, Assistant Marketing Officer, Kakinada.	15 May 1953 ..	4 June 1953.	

OFFICERS WHO WERE ON LEAVE—cont.

Name and designation.	Period		Remarks.
	From	To	
Sri N. Veeramohan Rao, Assistant Chemist, Sugarcane Research Station, Anakapalle.	25 June 1953 ..	4 Sep. 1953.	
" G. Venkatanarayana, Oil seeds Specialist (now Principal, Agricultural College, Bapatla).	16 Oct. 1952 ..	15 Feb. 1953.	
" K. Venkataraman, Deputy Director of Agriculture.	5 Sep. 1952 ..	5 Nov. 1952.	
" P. A. Venkateswara Ayyar, Agronomist and Professor of Agriculture, Coimbatore.	4 Apr. 1953 ..	30 May 1953.	
" M. Venkoba Rao, Assistant Cotton Specialist, Nandyal.	7 Feb. 1953 ..	6 May 1953.	
" P. Subramaniam, Assistant Millet Specialist, Nandyal.	9 Oct. 1952 ..	8 June 1953.	
" P. K. Parameswara Menon, District Agricultural Officer.	19 Mar. 1952 ..	17 Aug. 1952.	
" N. Krishna Pillai, District Agricultural Officer.	17 Mar. 1953 ..	23 June 1953.	
" T. S. Lakshmanan, Assistant Agricultural Chemist (since reverted).	7 Mar. 1952 ..	6 July 1952.	
" A. Raghavan, Assistant Cotton Specialist.	17 June 1952 ..	1 Aug. 1952.	
" T. N. Balasubramaniam, District Agricultural Officer.	31 Dec. 1952 ..	30 Jan. 1953	
" Dr. M. Srinivasan, Lecturer in Agricultural Economics.	4 Sep. 1952 ..	1 Feb. 1952.	
" P. S. Venkatasubramanyam, Special District Agricultural Officer (Crop Sampling).	29 June 1953 ..	.. ..	Leave sanctioned upto 28th October 1953.
" N. V. Kalyanasundaram, District Agricultural Officer.	17 May 1952 ..	13 July 1952.	
	17 Mar. 1953 ..	14 June 1953.	
" B. K. Sadasiva Rao, Assistant Agricultural Engineer (Civil), Coimbatore.	4 June 1952 ..	18 July 1952.	
" A. K. Ramasubba Ayyar, District Agricultural Officer.	2 Jan. 1952 ..	30 Mar. 1953.	
" M. J. David, District Agricultural Officer.	1 Dec. 1952 ..	19 Dec. 1952.	
" A. K. Subramaniam, Assistant Agricultural Engineer (Inspection), Vellore.	1 June 1953 ..	13 June 1953.	
" Dr. R. Ramamurthi Reddi, Bio-chemist, Kodur.	14 June 1952 ..	13 Aug. 1952 ..	Extraordinary leave.
	26 Oct. 1952 ..	25 June 1953 ..	Do.
" K. P. Sanjeva Shetty, Assistant Agricultural Engineer (Headquarters) Madras.	1 Aug. 1952 ..	28 Aug. 1952 ..	Leave on reversion from the Madras Agricultural Service.
" L. Krishnan, District Agricultural Officer, Nellore.	10 Apr. 1953 ..	9 May 1953.	
" B. G. Narayana Menon, Curator, Government Botanic Gardens, Ootacamund.	16 Feb. 1953 ..	7 Mar. 1953.	
" G. Venkatakrishnan, District Agricultural Officer.	27 June 1953 ..	9 Aug. 1953.	

Strength of staff in the Agricultural Department during 1952-53.

Category and name of post.	Number of posts.		
	Permanent.	Temporary.	Total.
GAZETTED OFFICERS.			
Category 1—			
Joint Director of Agriculture	1	1	2
Category 2—			
Principals of Agricultural Colleges	2	..	2
Headquarters Deputy Directors	2	1	3
Total ..	4	1	5
The 2 posts of Headquarters Deputy Directors (Engineering and Propaganda) are kept in abeyance.			
Category 3—			
Regional Deputy Directors including Deputy Director of Agriculture (Crop Sampling), and Compost Development Officer	6	4	..
Agronomist and Professor of Agriculture, Coimbatore	1	..	..
Senior Lecturer in Agriculture, Bapatla	1	..	..
State Marketing Officer	1	..	..
Total ..	9	4	13
Category 4—			
Paddy Specialist	1	..	..
Millet Specialist	1	..	..
Cotton Specialist	1	..	..
Oil Seeds Specialist	1	..	..
Fruit Specialist	1	..	..
Sugarcane Specialist	1	..	..
Cotton Extension Officer	..	1	..
Government Agricultural Chemist	1	..	..
Government Entomologist	1	..	..
Government Mycologist	1	..	..
Systematic Botanist and professor of Botany	1	..	..
Total ..	9	2	11
Category 5—			
District Agricultural Officers, Sugarcane Inspection and Seed Development Officers	27	3 + 10	..
Superintendent, Central Farm, Coimbatore	1	..	..
Superintendent, College Farm, Bapatla	1	..	..
Agronomist, Siruguppa	1	..	..
District Agricultural Officer (Crop Sampling)	..	8	..
Gazetted Assistant, Director of Agriculture's office	1	..	..
Lecturer in Agriculture, Coimbatore	1	..	..
Junior Lecturer in Agriculture, Bapatla	1	..	..
Assistant Marketing Officers	1	..	..
Agronomist, Agricultural Research Station, Satyamangalam	4	1	..
Cane Development Officer, Director of Agriculture's office	..	1	..
Special District Agricultural Officer, Tungabhadra Project	..	1	..
Principals and vice-principals of Community Projects (District Agricultural Officers)	..	3	..
Total ..	36	19 + 10	55 + 10
Category 6—			
Curator, Government Botanic Gardens, Ootacamund	1	..	1
Category 7—			
Lecturer in Agricultural Economics	1	1	..
Assistant Entomologist	5	5	..
Assistant Mycologists (including Sugarcane)	2	5	..

Strength of staff in the Agricultural Department during 1952-53—cont.

Category and name of post.	Number of posts.		
	Permanent.	Temporary.	Total.
GAZETTED OFFICERS—cont.			
Category 7—cont.			
Assistant Agricultural Chemists (including Sugarcane)	5	3	..
Assistant Agronomist	1	..	..
Agricultural Bacteriologist	1	..	..
Soil Physicist	1	..	..
Bio-Chemist	11	1	..
Superintendents, Agricultural Research Stations	3	9	..
Assistant Cotton Specialists	..	..	..
Assistant Paddy Specialists including Seed Development Officer (Paddy)	2	2	..
Assistant Millet Specialist including Seed Development Officer (Millets)	..	5	..
Assistant Oil Seeds Specialist	..	2	..
Assistant Fruit Specialist including Superintendent, Fruit Research Station, Kodur, Superintendent, Wynad Colonisation Scheme and Banana Research Officer, Aduthurai	2	5	..
Cytogeneticists	2	..	..
Plant Physiologists, Coimbatore and Bapatla and Assistant Physiologist, Anakapalle	1	2	..
Assistant Cotton Extension Officers	..	4	..
Assistant Lecturing and Systematic Botanist, Coimbatore, Lecturer and Gazetted Assistant Lecturer in Botany, Bapatla and Systematic Botanist, Aduthurai	2	2	..
Pepper Specialist	..	1	..
Cardamom Specialist	..	4	..
Superintendent, Sugarcane Liaison Farm	1	..	..
Agricultural Meteorologist	..	1	..
Chillies Specialist	..	..	..
Total ..	40	54	94
Category 8—			
Assistant Agricultural Engineer (Research)	1	..	..
Gazetted Assistant to Assistant Agricultural Engineer (Research)	..	1	..
.. .. .	1	1	2
Category 9—			
Assistant Agricultural Engineers (Civil)	2	..	..
Assistant Agricultural Engineers (Mechanical)	2	1	..
Assistant Agricultural Engineers (Headquarters)	2	6	..
Assistant Agricultural Engineers (Inspection)	..	..	..
Assistant Agricultural Engineers (Tractor Workshop)	..	3	..
Assistant Agricultural Engineer (Pilot scheme, Bellary)	..	1	..
Assistant Agricultural Engineer (Soil Conservation scheme), Bellary, Nilgiris and Chittoor	..	3	..
Assistant Agricultural Engineer, Groundnut, machinery Scheme, Coimbatore	..	1	..
Total ..	6	15	21
Personal Assistant to the Director of Agriculture (Madras Civil Service, Executive Branch)	1	..	..
Lecturer in Animal Hygiene (Madras Veterinary Service)	1	..	..
Junior Accounts Officer	..	1	..
Assistant Accounts Officer	..	1	..
Junior Accounts Officer	..	..	..
Total ..	2	3	5
Grand total ..	109	100 + 10	209 + 10

APPENDIX No. 22.

Statement showing the strength of the Non-gazetted in the Agricultural Department under various categories on 30th June 1953:

Upper Subordinates.

Category and name of post.	Number of posts.		
	Permanent.	Temporary.	Total.
<i>I. Research Section.</i>			
1 Paddy section	38	11	49
2 Millet section	20	12	32
3 Cotton section	26	26	52
4 Oil Seeds section	11	9	20
5 Pulses section	4	..	4
6 Botany section	9	1	10
8 Sugarcane section	14	41	55
9 Cytogenetics section	5	1	6
10 Plant Physiology section	1	1	2
11 Mycology section	2	4	6
12 Entomology section	12	10	22
13 Chemistry section.. .. .	17	6	23
14 Pepper section	24	23	47
15 Potato section	1	3	4
16 Curator section	3	..	3
17 Meteriology	3	..	3
18 Librarian section	1	6	7
19 Chillies section	1	..	1
	..	2	2
Total ..	192	156	348

II. Agricultural Section.

1 Personal Assistant to the District Agricultural Officers	25	1	26
2 Taluk Agricultural Demonstrators	237	..	237
3 Marketing Assistants	6	..	6
4 Ento-Mycology Agricultural Demonstrators	10	44	54
5 Farm Manager, Agricultural Research Stations	27	20	47
6 Teaching Assistants in Agriculture	12	4	16
7 Jail Agricultural Instructor	3	..	3
8 Journal Assistants	2	2	4
9 Agricultural Demonstrator, Vegetable, Madras	3	..	3
10 Technical Assistant to the Director of Agriculture	1	..	1
11 Agricultural Demonstrators on schemes	..	290	290
12 Physical Directors	..	2	2
Total	326	363	689

III. Engineering Staff.

1 Agricultural Engineering Supervisors	23	54	77
2 Tractor Foreman	12	28	40
3 Assistant Tractor Foreman	12	18	30
4 Senior Mechanic	1	29	30
5 Junior Mechanic	1	1	2

Statement showing the strength of the Non-gazetted in the Agricultural Department under various categories on 30th June 1953—cont.

Upper Subordinates—cont.

Category and name of post.	Number of posts.		Total.
	Permanent.	Temporary.	
III. Engineering Staff—cont.			
6 Senior Tractor Driver	100		100
7 Junior Tractor Driver	240		240
8 Oil Engines and Pumpset Drivers	700		700
9 Lorry Drivers	40		40
10 Jeep Drivers	35		35
11 Fitters	12		12
12 Loading Inspector	2		2
13 Welders	3		3
14 Tractor Cleaners	340		340
15 Jeep and Lorry Cleaners	19		19
16 Bus Drivers	6		6
17 Millers	2		2
Total	49	1,629	1,678

IV. Madras Ministerial Service.

1 Manager	1	..	1
2 Senior Superintendents	5	4	9
3 Junior Superintendents	12	20	32
4 Store Superintendents	..	4	4
5 Upper Division Clerks	52	226	278
6 Lower Division Clerks (including store-keeper I grade)	252	789	1,041
7 Typists and Steno-typist	57	100	157
8 Store-keepers II Grade	8	9	17
9 Store-keepers III Grade	..	25	25
Total	387	1,177	1,564

V. Madras Agricultural Subordinate Service.

1 Fieldmen	200	961	1,161
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VI. The Madras General Subordinate Service.

1 Demonstration Maistries	500	1,672	2,172
2 Artists	9	7	16
3 Mechanics	5	2	7
4 Sanitary Inspectors	1	..	1
5 Librarians	1	1	2
6 Ward attendant	1	..	1
7 Foreman	1	..	1
8 Museum Curator	1	1	2
9 Compounder	2	..	2
10 Blacksmiths	1	..	1
11 Drivers	9	49	58
12 Inspectory attendant	..	3	3
13 Laboratory attenders	7	20	27
14 Teachers	..	..	..
15 Attenders	..	..	..
Total	533	1,756	2,294

MA DRAS AGRICULTURAL SUBORDINATE SERVICE.

List of temporary posts in Upper Subordinate Service as on 1st July 1953.

Serial number.	Sanction number.	Name of scheme.	Post.	Number sanctioned.	G.O. number and date.	From	To	Section number.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	4	Sugarcane Scheme, Anakkal.	Assistants in Agronomy Assistants in Physiology Assistants in Mycology Assistants in Chemistry Assistants in Entomology Farm Managers Additional Farm Manager.	2 2 2 2 2 4 1	Permitted to continue the scheme for five years in G.O. Ms. No. 5549, Development, dated 28th December 1952. G.O. No. 1465, Development, dated 6th April 1953.	1st Apr. 1952	31st Mar. 1957	D-1, 677/52, dated 6th Jan. 1953.
2	13	Wynad Colonization Scheme.				1st Apr. 1953	31st Mar. 1954	L. 103/53, dated 6th Apr. 1953.
3	21	Cotton seed multiplication schemes in Coimbatore district.	Special Agricultural Demonstrators.	5	Government Memoandum No. 84515-K/52-1953, dated 6th July 1953.	Beyond 30th June 1953.		Y-3, 314/53, dated 12th July 1953.
4	43	Scheme for breeding varieties of camellia cotton at Srirangapatna.	Cotton Assistants	5	G.O. No. 2105, Food and Agriculture, dated 11th November 1950.	1st Apr. 1950	31st Mar. 1955	Y. 581/49, dated 23rd Nov. 1950.
44		Scheme for the evolution of long staple cotton Agricultural Research Station, Palur.	Do.	2	G.O. Ms. No. 768, Food and Agriculture, dated 21st May 1953.	23rd Nov. 1951	22nd Nov. 1956	Y. 1008/52, dated 4th June 1953.
6	69	Agricultural Research Station, Ambasamudram.	Paddy Assistant, Ambasamudram.	1	G.O. No. 128, Food and Agriculture, dated 2nd February 1953.	23rd Apr. 1953	22nd Apr. 1954	X. 18/53, dated 6th Feb. 1953.
7	72	Hybrid Cumbu Scheme, Coimbatore.	Millet Assistants	4	G.O. Ms. No. 539, Food and Agriculture, dated 28th March 1952.	20th Mar. 1952	19th Mar. 1957	D-1, 946/51, dated 1st Apr. 1952.
8	84	Agricultural College, Repattal.	Teaching Assistants in Agriculture. Teaching Assistants in Agricultural Economics. Teaching Assistant in Agricultural Mycology. Teaching Assistant in Cytogenetics. Farm Managers	2 2 1 1 2	G.O. Ms. No. 341, Food and Agriculture, dated 12th March 1953.	1st Apr. 1953	31st Mar. 1954	X. 45/53.
9	89	Improvement of Agricultural practices in Parvathipur Division.	Agricultural Demonstrators.	2	G.O. Ms. No. 418, Food and Agriculture, dated 24th March 1953.	1st Apr. 1953	31st Mar. 1954	D. Dis. L. 132/53, dated 31st Mar. 1953.
10	90	Indian Central Cotton Committee Scheme for the multiplication, distribution and marketing of Co. 4 cotton in Madras State.	Do.	8	Government Memoandum No. 84264/K-52-20, dated 19th June 1953.	30th June 1953	29th Sep. 1953	Y-2, 351/53, dated 25th June 1953.

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11	96	Scheme for the improvement of chillies in the Province.	Assistants	2	G.O. Ms. No. 1199, Food and Agriculture, dated 24th June 1951.	1st Apr. 1952	31st Mar. 1954	D-1, 178/50, dated 16th June 1951.
12	101	Teaching Assistants in Horticulture, Repattal.	Assistant	1	G.O. No. 1501, Food and Agriculture, dated 9th June 1951.	10th Dec. 1952	9th Dec. 1963	D. Dis. X. 1197/53, dated 1st Nov. 1952.
13	103	Comprehensive scheme for establishment of coconut nurseries in important districts of the province.	Assistants	10	G.O. No. 5154, Food and Agriculture, dated 19th October 1948.	10th Nov. 1948	9th Nov. 1953	D. 1054/47, dated 28th Oct. 1948.
14	104	Additional staff for plant protection work in districts.	Do.	42	G.O. No. 102, Food and Agriculture (Food Production), dated 14th March 1952.	1st Apr. 1952	31st Mar. 1953	L. 2237/51, dated 20th Mar. 1952.
15	110	Additional staff for Mycology and Botany sections—Agricultural College, Repattal.	Assistants in Botany and Mycology.	2	G.O. Ms. No. 298, Food and Agriculture, dated 18th February 1953.	1st Apr. 1953	31st Mar. 1954	D. Dis. X. 193/53, dated 20th Feb. 1953.
16	114	Scheme for Banana Research at Maruthuvairudi, Kumbakonam, under Superintendent Agricultural Research Station, Aduthurai.	Assistants	2	G.O. No. 6241, Development, dated 10th December 1943.	1st Apr. 1949	31st Mar. 1954	Y-1, 187/48.
17	115	Scheme for the development of sugarcane industry.	Farm Managers	8	G.O. No. 73, Development (Planning and Development), dated 5th January 1949.	Scheme is being continued.		
18	116	Grow More Food Scheme No. 1 for fruit breeding and contour trenching in Coimbatore districts.	Agricultural Demonstrators.	24	G.O. Ms. No. 3318, Development (Planning and Development), dated 2nd August 1952.	8th Aug. 1952	7th Aug. 1953	TT-3, 1771/52, dated 5th Aug. 1952.
19	122	Scheme for the production of improved strains of millets at Regional Research Stations.	Millet Assistants	4	G.O. No. 1565, Development, dated 24th March 1949.	1st Apr. 1949	31st Mar. 1954	X. 767/47, dated 28th Mar. 1949.
20	126	Scheme for the breeding of long staple american cotton as a winter crop in the Central Districts and sea island cotton in the West coast.	Cotton Assistants	7	G.O. Ms. No. 2081, Development, dated 18th April 1949.		31st Mar. 1954	Y-2, 25/49, dated 21st Apr. 1949.
21	130	Assistant in oil seeds—Agricultural (Coconut) Research Station, Pillecode.	Additional Assistants in Oil Seeds.	1	G.O. No. 471, Food and Agriculture, dated 20th March 1953.	23rd May 1953	22nd May 1954	X. 315/53, dated 15th Apr. 1953.
22	127	Scheme for scientific aid to pepper industry in South India.	Additional Pepper Assistants	2	G.O. No. 996, Food and Agriculture, dated 16th June 1952.	1st Sep. 1952	22nd Dec. 1953	D. 516/52, dated 23rd June 1952.
23	139	Publication of departmental journals in Malayalam and Kannada.	Assistants	2	G.O. Ms. No. 1742, Food and Agriculture, dated 10th November 1952.	1st Apr. 1953	31st Mar. 1954	JL 250/52, dated 27th Nov. 1952.
24	152	Scheme for the improvement of white northens in Madras State.	Upper Subordinates	2	G.O. Ms. No. 2532, Development, dated 25th May 1953.	25th June 1953	24th June 1954	Y. 219/53, dated 7th June 1953.

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List of temporary posts in Upper Subordinate Service as on 1st July 1953.—cont.

Serial number.	Section number.	Name of scheme.	Post.	Number sanctioned.	G.O. number and date.	From	To.	Section number.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	134	Improvement of Western cotton in the Madras State.	Assistants	8	G.O. Ms. No. 2362, Development, dated 3rd May 1949.	1st Apr. 1949	31st Mar. 1954	Y-2, 559/49, dated 10th May 1949.
26	135	Scheme for the improvement of Tianevelles and Karunganni cotton.	Do.	3	G.O. No. 2365, Development, dated 3rd May 1949.	..	31st Mar. 1954	Y-2, 702/49, dated 10th May 1949.
27	136	Employment of women demonstrators trained in Fruit canning and preservation.	Women Agricultural demonstrators.	1	G.O. Ms. No. 725, Food and Agriculture, dated 26th April 1952.	1st June 1952	31st May 1953	Y-2, 259/52, dated 5th June 1952.
28	141	Scheme for research on Ginger cultivation.	Assistant	1	G.O. Ms. No. 847, Food and Agriculture, dated 1st June 1953.	1st Feb. 1953	31st Jan. 1956	DI, 39/53, dated 10th June 1953.
29	142	Indian Council of Agricultural Research—Scheme for research on the control of striga attack on Sorghum.	Assistants in millets	4	G.O. Ms. No. 1293, dated 26th June 1951.	22nd Sep. 1953	21st Sep. 1954	DI, 331/51, dated 7th July 1951.
30	143	Fruit Development work—Thunniagam fruits, Madurai district.	Special Agricultural Demonstrator.	1	G.O. No. 448, Rural Welfare Department, dated 25th March 1953.	1st Apr. 1953	31st July 1953	L, 1140/53.
31	144	Employment of 100 Agricultural Demonstrators—Two year plan.	Additional Agricultural Demonstrators.	100	G.O. No. 336, Food and Agriculture, dated 17th February 1953.	1st Apr. 1953	31st Mar. 1954	..
32	145	Seed Development Scheme	Assistants	33	G.O. Ms. No. 109, Food and Agriculture (Food Product on), dated 18th March 1953.	1st Apr. 1953	31st Mar. 1954	..
33	152	Paddy Station, Mangalore	Assistant in Paddy	1	G.O. No. 381, Food and Agriculture, dated 18th March 1953.	15th May 1953	14th May 1954	..
34	154	Scheme for the establishment of a Coconut Nursery in Tiruchirappalli district.	Assistant	1	G.O. Ms. No. 834, Food and Agriculture, dated 23rd February 1950.	29th Apr. 1950	23rd Mar. 1955	D-2, 547/49.
35	156	Fruit and Fruit Products Development Scheme for the establishment of Model orchards (in nurseries).	Assistants	5	G.O. No. 811, Food and Agriculture, dated 28th April 1950.	9th Dec. 1951	8th Dec. 1956	..
36	157	Additional Staff for Bapatla College Farm.	Farm Managers { Dairy Manager	2 } 1 }	G.O. Ms. No. 341, Food and Agriculture, dated 18th March 1953.	1st Apr. 1953	31st Mar. 1954	N, 45/53, dated 10th Mar. 1954.

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37	159	Improvement to Tadas in the Special Agricultural Demonstration.	1	G.O. No. 417, Food and Agriculture, dated 27th May 1953.	1st May 1953	30th Apr. 1954	L-4, 600/53, dated 3rd June 1953.
38	160	Opening of a Research Station for work on deep water paddy in West Godavari district.	1	G.O. No. 976, Food and Agriculture, dated 24th May 1950.	17th Dec. 1950	16th Dec. 1955	..
39	168	Co-ordinated wepp weather scheme.	5	G.O. No. 923, Food and Agriculture, dated 15th June 1953.	..	26th Jan. 1954	D-2, 492/53.
40	167	Scheme for the training of Agricultural and Science graduates in Horticulture.	1	G.O. Ms. No. 1394, Food and Agriculture, dated 27th August 1952.	14th Aug. 1952	18th Aug. 1954	Y, 44/52, dated 4th Sep. 1952.
41	169	Agricultural Meteorology—Technical Assistant.	1	G.O. No. 117, Food and Agriculture, dated 12th May 1953.	1st Apr. 1953	31st Mar. 1954	R, 124, D, 33/53, dated 22nd May 1953.
42	176	Scheme for breeding of improved Cotton in Madras State.	1	G.O. Ms. No. 169, Food and Agriculture, dated 3rd September 1950.	26th Oct. 1950	25th Oct. 1955	..
43	177	Indian Council of Agricultural Research—Scheme for the improvement of sweet potato and yam.	3	G.O. Ms. No. 177, Food and Agriculture, dated 16th May 1953.	1st Oct. 1953	30th Sep. 1956	D-1, 1494/52, dated 20th May 1953.
44	178	Indian Central Committee—Mung bean scheme in Madras State.	1	G.O. Ms. No. 1675, Food and Agriculture, dated 17th August 1950.	24th May 1950	23rd May 1955	Y-2/50.
45	179	Irrigation projects—Tungabhadra Project—Localisation of agricultural staff.	3	G.O. Ms. No. 959, Food and Agriculture, dated 6th March 1953.	28th Nov. 1953	27th Nov. 1953	..
46	180	Additional staff of four Assistants in Chemistry for the Agricultural Research Institute, Coimbatore.	4	G.O. Ms. No. 1793, Food and Agriculture, dated 19th November 1952.	15th Dec. 1952	16th Dec. 1953	X, 1654/52, dated 26th Nov. 1952.
47	188	Bifurcation of Malabar District.	1	G.O. Ms. No. 312, Food and Agriculture, dated 9th March 1953.	1st Apr. 1953	31st Mar. 1954	K, 134/53, dated 15th Mar. 1953.
48	189	Indian Central Committee—Scheme for the establishment of Coconut Research Station in East Godavari district.	2	G.O. Ms. No. 855, Food and Agriculture, dated 28th April 1951.	..	..	..
49	191	Fruit products—Development of fruit industry in Kodakal hills.	1	G.O. Ms. No. 723, Food and Agriculture, dated 13th May 1953.	11th July 1953	10th July 1954	Y, 469/53, dated 22nd May 1953.
50	193	Opening of an Agricultural Research Station at Bapatnam in the Lower Bhavani Project area.	1	G.O. Ms. No. 982, Food and Agriculture, dated 3rd May 1952.	7th Aug. 1952	6th Aug. 1953	D-8, 171/52, dated 12th May 1952.

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MADRAS AGRICULTURAL SUBORDINATE SERVICE—cont.

List of temporary posts in Upper Subordinate Service as on 1st July 1952—cont.

Serial number.	Sanction number.	Name of scheme.	Post.	Number sanctioned.	G.O. number and date.	From.	To.	Section number.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
51	195	Indian Central Oil-seeds Committee—Scheme to run six zonal nuclei seed farms of improved oil seed strains.	Oilseeds Assistants ..	6	G.O. Ms. No. 1082, Food and Agriculture, dated 25th May 1951.	29th Dec. 1951 ..	23th Dec. 1956 ..	D-3. 619/50 dated 1st June 1951.
52	197	Scheme for studies on laterite soils in Madras State.	Analyst ..	1	G.O. Ms. No. 1097, Food and Agriculture, dated 10th June 1953.	20th July 1953 ..	19th July 1954 ..	X. 379/53, dated 16th July 1953.
53	199	Co. 4 Cotton Certification scheme.	Certification Inspectors ..	6	G.O. Ms. No. 4686, Food and Agriculture, dated 4th November 1952.	..	31st Mar. 1954 ..	C/4-1863/52.
54	200	Indian Council of Agricultural Research—Scheme for manual varietal and agronomic trials to determine optimum yield.	Statistical Assistants in Chemistry, Asst. in Chemistry Analytical Assistants Assistants for soil survey.	1 5 2 7	G.O. No. 1581, Food and Agriculture, dated 7th August 1951.	10th Sep. 1951 ..	18th Sep. 1954 ..	D-1-532/51, dated 11th August 1951.
55	203	Indian Council of Agricultural Research—Scheme for conducting research on cashew-nut in Madras.	Fruit Assistants ..	2	G.O. Ms. No. 1146, Food and Agriculture, dated 15th July 1952.	1st August 1952 ..	31st July 1956 ..	Y-1. 793/52, dated 24th July 1952.
56	203	Post-graduate training at the Indian Agricultural Research Institute, New Delhi.	Farm Manager ..	1	G.O. No. 1674, Food and Agriculture, dated 21st August 1951.	1st October 1951 ..	30th September 1953.	X-2. 725/51.
57	205	Opening of an Agricultural Farm at Paramakudi.	Do. ..	1	G.O. No. 1740, Food and Agriculture, dated 1st April 1953.	1st April 1953 ..	31st March 1954 ..	X. 993/50, dated 12th September 1951.
58	206	Deputation of Assistants for Post-graduate Course in Mycology and Entomology at the Indian Agricultural Research Institute, New Delhi.	Assistant in Mycology ..	1	G.O. No. 1828, Food and Agriculture, dated 15th September 1951.	1st October 1951 ..	30th September 1953.	X-2. 724/51, dated 19th September 1951.
59	208	Scheme for the investigation of stem breaking disease of arecanut palm.	Assistant in Mycology ..	3	G.O. No. 1900, Food and Agriculture, dated 10th September 1951.	1st August 1952 ..	31st July 1952 ..	D-2. 459/49, dated 21st September 1951.
60	209	Scheme for starting of Regional Bee Research Station at Paramakudi.	Assistant in Entomology ..	1	G.O. No. 2060, Food and Agriculture, dated 20th October 1951.	1st April 1951 ..	31st March 1954 ..	L. 945/51, dated 3rd November 1951.
61	212	Scheme for multiplication and distribution of C. 1 and 33-B cotton in Guntur district.	Special Agricultural Demonstrator ..	1	G.O. Ms. No. 187, Food and Agriculture, dated 13th February 1952.	1st September 1951.	31st August 1955 ..	Y-150/51, dated 22nd February 1952.

62	215	Indian Council of Agricultural Research—Scheme for investigation of the possibilities of pre-soaking seeds in nutritive salt as method of improving crop yield.	Assistant in Plant Physiology ..	1	G.O. No. 566, Food and Agriculture, dated 31st March 1952.	1st April 1952 ..	31st March 1953 ..	D-1-927/51, dated 4th April 1952.
63	217	Appointment of an additional Agricultural Demonstrator for Oorupalli taluk.	Additional Agricultural Demonstrator ..	1	G.O. Ms. No. 579, Food and Agriculture, dated 20th April 1953.	5th May 1953 ..	4th May 1954 ..	..
64	221	Contour Bunding Scheme for Famine Relief—Chittoor district.	Soil Conservation Assistants.	6	G.O. No. 165, Revenue (Famine Relief), dated 11th December 1952.	Beyond 31st March 1953.	..	..
65	223	Training in Agricultural Statistics at Indian Council of Agricultural Research, New Delhi.	Assistant in Pulses Soil Survey Assistant ..	1 1	G.O. Ms. No. 1302, Food and Agriculture, dated 9th August 1952.	14th August 1952 ..	13th August 1953 ..	X-2-762/52, dated 9th August 1952.
66	224	Contour Bunding Scheme for Famine Relief.	Soil Conservation Assistants.	3	G.O. Ms. No. 939, Revenue, dated 31st March 1953.	1st April 1953 ..	30th September 1953.	..
67	225	Scheme for the establishment of Zonal Parasite Breeding Stations for Biological Control of Nephthys Serripa.	Assistant in Entomology ..	2	G.O. No. 1111, Food and Agriculture, dated 9th July 1952.	..	26th June 1954 ..	L-1-927/52.
68	227	Planning Commission Community Projects.	Special Agricultural Demonstrators.	17	G.O. No. 2202, Public (Community Project), dated 9th September 1952.	1st October 1952 ..	30th September 1955.	..
69	228	Scheme for research on eradication of weeds by herbicidal chemicals in Madras State.	Assistant in Plant Physiology ..	1	G.O. Ms. No. 1638, Food and Agriculture, dated 21st October 1952.	..	2nd December 1953.	D-1-995/51, dated 30th October 1952.
70	229	Administration of work relating to the Madras Sugar Factories Control Act 1949.	Special Agricultural Demonstrators.	3	G.O. Ms. No. 1911, Food and Agriculture, dated 10th December 1952.	..	7th January 1954 ..	D-1-1095/52, dated 12th December 1952.
71	230	Soil conservation—Belliary and Anantapur district—Scheme for black soil area extension.	Soil Conservation Assistants.	3	G.O. No. 166, Development (Planning and Development), dated 16th January 1953.	..	7th Aug. 1953 ..	..
72	231	Coconut Seed Distribution Scheme.	Agricultural Demonstrator.	1	G.O. No. 283, Food and Agriculture, dated 28th February 1953.	15th Mar. 1953 ..	14th Sep. 1953 ..	D-2-1588/52, dated 4th March 1953.
73	233	Agriculture—Intensive Cultivation Scheme—Distribution of chemical manures—Intensive Manuring Scheme.	Agricultural Demonstrators.	75	G.O. Ms. No. 155, Food and Agriculture, dated 16th April 1953.	..	..	..
74	234	Opening of Refresher Course in Agriculture for young farmers.	Agricultural Instructors ..	3	G.O. Ms. No. 491, Food and Agriculture, dated 31st March 1953.	1st July 1953 ..	31st Dec. 1953 ..	X-4-1093/52, dated 14th April 1953.
75	235	Employment of Special Agricultural staff for the farms selected during 1952-53—training of ..	Agricultural Demonstrators.	2	G.O. Ms. No. 973, Rural Welfare, dated 18th May 1953.	Not filled ..	Not filled ..	L-4-1131/53, dated 1st June 1953.

MADRAS AGRICULTURAL SUBORDINATE SERVICE—cont.

List of temporary posts in Upper Subordinate Service as on 1st July 1952—cont.

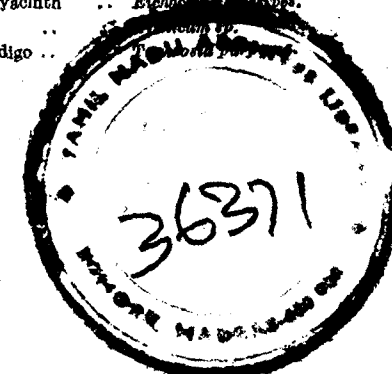
Serial number.	Scheme number.	Name of scheme.	Post.	Number sanctioned.	G.O. number and date.	From	To	Section number.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
76	236	Agriculture—Soil conservation—Training of non-Andhra subordinates at Bellary.	Agricultural Demonstrators.	4	G.O. Ms. No. 2504, (Plan-Development and Development), dated 20th May 1953.	Not filled	..	TT. 3-2-50/52, dated 10th June 1953.
77	237	Indian Council of Agricultural Research—Scheme for breeding of paddy resistant strains of paddy of duration.	Assistants in Paddy..	4	G.O. Ms. No. 839, Food and Agriculture, dated 30th May 1953.	30th June 1953	..	..
78	238	Training of Demonstration Maistris at Anakapalle and Aduthurai.	Special Agricultural Demonstrators.	2	G.O. No. 1877, Food and Agriculture, dated 18th June 1953.	Not filled	..	V. 273/52, dated 18th June 1953.

APPENDIX No. 23.

Glossary.

Apple	..	<i>Pyrus malus.</i>	Linseed	..	<i>Linum catharticum.</i>
Areca nut	..	<i>Areca catechu.</i>	Loquats	..	<i>Eriobotrya Japonica.</i>
Barley	..	<i>Hordeum vulgare.</i>	Lucerne	..	<i>Medicago sativa.</i>
Bengalgram	..	<i>Cicer arietinum.</i>	Maize	..	<i>Zea Mays.</i>
Ber	..	<i>Zizyphus jujuba.</i>	Mango	..	<i>Mangifera indica.</i>
Betel vine	..	<i>Pepper betle.</i>	Mongosteen	..	<i>Garcinia mangostana.</i>
Blackgram	..	<i>Phaseolus mungo.</i>	Mustard	..	<i>Brassica juncea.</i>
Brinjal	..	<i>Solanum melongena.</i>	Nappier grass	..	<i>Pennisetum purpurcum.</i>
Cardamom	..	<i>Elettaria cardamomum.</i>	Neem	..	<i>Azadirachta indica.</i>
Carrot	..	<i>Daucus carota.</i>	Oats	..	<i>Avena sativa.</i>
Cashewnut	..	<i>Anacardium occidentale.</i>	Onions	..	<i>Allium cepa.</i>
Castor	..	<i>Ricinus communis.</i>	Oranges	..	<i>Citrus sp.</i>
Chillies	..	<i>Capiscum Sp.</i>	Paddy	..	<i>Oryza sativa.</i>
Cholam	..	<i>Sorghum Sp.</i>	Panivaragu	..	<i>Panicum miliaceum.</i>
Cloves	..	<i>Eugenia caryophyllata.</i>	Palmyra	..	<i>Borassus flabellifer.</i>
Cocunut	..	<i>Cocos nucifera.</i>	Papaya	..	<i>Carica papaya.</i>
Coffee	..	<i>Coffea arabica.</i>	Peach	..	<i>Prunus persica.</i>
Coriander	..	<i>Coriandrum sativum.</i>	Pears	..	<i>Pyrus communis.</i>
Cotton	..	<i>Gossypium sp.</i>	Pepper	..	<i>Piper nigrum.</i>
Cambodia cotton	..	<i>Gossypium hirsutum.</i>	Phillipesara	..	<i>Phaseolus trilobus.</i>
Karungani cotton	..	<i>Gossypium arboreum var. neglectum forma indica.</i>	Pineapple	..	<i>Ananas sativus.</i>
Pulichal cotton	..	<i>Gossypium arboreum var. neglectum forma benvalensis.</i>	Plantain	..	<i>Musa sapientum.</i>
Western cotton	..	Mixture of <i>Gossypium herbaceum</i> and <i>G. arboreum.</i>	Plums	..	<i>Prunus salicina.</i>
Northern cotton	..	<i>Gossypium arboreum var. typicum forma indica.</i>	Pomegranate	..	<i>Punica granatum.</i>
Roseum 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>
Cumbu	..	<i>Pennisetum typhoides.</i>	Ragi	..	<i>Eleusine coracana.</i>
Damulaha	..	<i>Sebania aculeata.</i>	Redgram	..	<i>Cajanus cajan.</i>
Durlan	..	<i>Duriozibethinus.</i>	Rubber plant	..	<i>Cryptostegia grandiflora.</i>
Field beans	..	<i>Dolichos lablab.</i>	Safflower	..	<i>Carthamus tinctorius.</i>
Fig	..	<i>Ficus carica.</i>	Samai	..	<i>Panicum miliare.</i>
Garlic	..	<i>Allium sativum.</i>	Sapota	..	<i>Achras sapota.</i>
Griggelly	..	<i>Seasum orientale.</i>	Soya beans	..	<i>Glycine max.</i>
Ginger	..	<i>Zingiber officinale.</i>	Straw berries	..	<i>Fragaria vesca.</i>
Gogu	..	<i>Hibiscus cannabinus.</i>	Sugarcane	..	<i>Saccharum officinarum.</i>
Grape fruit	..	<i>Citrus paradisi.</i>	Sunn hemp	..	<i>Crotolaria juncea.</i>
Greengram	..	<i>Phaseolus aureus.</i>	Tamarind	..	<i>Tamarindus indica.</i>
Groundnut	..	<i>Arachis hypogea.</i>	Tapioca	..	<i>Manihot utilisima.</i>
Guava	..	<i>Psidium guajava.</i>	Tenai	..	<i>Scleria italica.</i>
Guinea grass	..	<i>Panicum maximum.</i>	Teosinte	..	<i>Euchlaena mexicana.</i>
Indigo	..	<i>Indigofera sumatrana.</i>	Tobacco	..	<i>Nicotiana tabacum.</i>
Jack	..	<i>Artocarpus integer.</i>	Tree-tomato	..	<i>Cyphomandra betacea.</i>
Kikuyu grass	..	<i>Pennisetum clandestinum.</i>	Traveller's tree	..	<i>Ravenala madagascariensis.</i>
Kollanti	..	<i>Tephrosia purpurea.</i>	Tung oil plant	..	<i>Aleurites fordii.</i>
Killagangera	..	<i>Ipomea hispida.</i>	Turmeric	..	<i>Curcuma longa.</i>
Kolukattel grass	..	<i>Cenchrus ciliaris.</i>	Varagu	..	<i>Paspalum scrobiculatum.</i>
Korra	..	<i>Setaria italica.</i>	Variga	..	<i>Panicum miliaceum.</i>
Lime	..	<i>Citrus aurantifolia.</i>	Water hyacinth	..	<i>Eichhornia crassipes.</i>
			Wheat	..	
			Wild indigo	..	

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