AGRICULTURAL DEPARTMENT

ADMINISTRATION REPORT

OF THE

AGRICULTURAL DEPARTMENT

FOR

FASLI YEAR 1953-54

PARTS I & II

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ADMINISTRATION REPORT OF THE AGRICULTURAL DEPARTMENT FOR THE YEAR 1st JULY TO 30th SEPTEMBER 1953.

PART I.

I. ADMINISTRATION.

1. (1) Sri M. S. Sivaraman, I.C.S., continued as Director of Agriculture throughout the period under report. Sri B. M. Lakshmipathy Mudaliar, Joint Director of Agriculture (Engineering) and Sri M. Kantiraj, Joint Director of Agriculture (Extension), also continued in the respective posts. The post of Joint Director of Agriculture (Extension) was abolished on 1st October 1953. Sri M. Kantiraj was allotted to Andhra State from 1st October 1953. The post of Joint Director of Agriculture (Engineering) was abolished with effect from 31st October 1953, afternoon and the post of Headquarters Deputy Director of Agriculture (Engineering) has been created in its place.

(2) Dr. K. C. Naik and Sri S. N. Venkataramana Iyer continued as Headquarters Deputy Director of Agriculture (Research) and Headquarters Deputy Director of Agriculture (Inspection) respectively throughout the period under report.

(3) Sri E. S. Nagesan was Personal Assistant to the Director of Agriculture during the period.

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.

* (2) Sri D. Viswanatha Reddi, Deputy Director of Agriculture, as Compost Development Officer, till 30th September 1953.

(3) Sri K. R. Nagarajan, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), till 30th September 1953.

(4) Sri M. S. Kylasam, Assistant Entomologist, as Assistant Entomologist (Civil Supplies).

* (5) Sri C. Krishnamurthy, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), till 30th September 1953.

(6) Sri P. R. Nagaraja Rao, Assistant Entomologist, as Assistant Entomologist (Civil Supplies), up to 30th September 1953.

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

(1) Sri K. Bramachari, Assistant Director (Storage), Madras, till 30th September 1953.

(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.

4. *Officers who were on foreign service.*—(1) Sri K. Kunhikannan Nambiar, Superintendent, Agricultural Research Station, as Secretary, Indian Central Arecanut Committee, from 25th October 1949.

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

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

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

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

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

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

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

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

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

(11) Sri M. M. Krishna Marar, Assistant Oilseeds Specialist, on other duty under the Central Coconut Research Station, Kasaragod.

* Indicates Andhras allotted to Andhra State from 1st October 1953

II. INSPECTION AND AUDIT.

1. *Director of Agriculture.*—During the three month period from July to September 1953, the Director of Agriculture inspected the Agricultural Research Stations, Siruguppa, Hagari, Aduthurai, Tirurkuppam, Maruteru, Anakapalle, Samalkota, Sugarcane Liaison Farm, Hospet and the crop breeding stations at Coimbatore.

2. *Headquarters Deputy Directors of Agriculture.*—The Deputy Director of Agriculture, Headquarters (Research) inspected the following research stations and centres.

(*a*) Regional Millets Station, Ongole.
(*b*) Cocanadas Cotton Improvement Scheme, Narasaraopet.
(*c*) College Farm, Bapatla.
(*d*) Tuber Scheme, Bapatla.
(*e*) Rice Research Station, Buchireddipalem.
(*f*) Regional Millets Station, Ariyalur.
(*g*) Coconut Nursery, Marudur.
(*h*) Sugarcane Liaison Farm, Kulittalai.

3. The Deputy Director of Agriculture, Headquarters (Engineering), inspected the work of the Assistant Agricultural Engineer (C.A.E.S.), Saidapet, Assistant Agricultural Engineer (Research), Coimbatore and Assistant Agricultural Engineer (Tractor Workshop), Coimbatore and found the efficiency and over all discipline in the offices inspected satisfactory.

4. The Deputy Director of Agriculture, Headquarters (Inspection), inspected the following offices during the period under report, namely, Sugarcane Research Station, Anakapalle, Offices of Deputy Directors of Agriculture, Visakhapatnam and Cuddapah, Fruit Research Station, Kodur and Bio-Chemist, Kodur and found that the offices are maintained satisfactorily and efficiently with no serious defects.

5. *Regional Deputy Director of Agriculture.*—The Regional Deputy Directors of Agriculture inspected the offices of the District Agricultural Officers and Agricultural Demonstrators and checked up the district work. In general, the work was found satisfactory. The details of offices inspected is as follows :—

Deputy Director of Agriculture.	Number of offices required to be inspected.	Number actually inspected.	Remarks.
Tanjore	8	..	..
Vellore	1	1	Satisfactory.
Madurai	..	..	..
Coimbatore	3	3	Satisfactory.

Besides, a number of depots were inspected by them.

6. *Heads of Research sections.*—The heads of research sections conducted inspection of the offices and work of their subordinate officers. Details of inspections conducted are given below :—

	Number of offices required to be inspected.	Number actually inspected.	Remarks.
Government Agricultural Chemist	3	..	
Government Mycologist	2	1	
Cotton Specialist	5	2	
Paddy Specialist	5	..	
Millets and Pulses Specialist ..	7	3	
Horticulturist and Professor of Horticulture	3	..	
Oilseeds Specialist	1	..	

The offices and work in general were found to be satisfactory.

7. *Audit and inspection by the internal audit party.*—The six internal audit parties, each consisting of one auditor, one upper division clerk and one lower division clerk conducted the audit and inspection of the following offices :—

Name of office.	Number audited.
1. Agricultural Research Stations, Coconut Nursery and Sugarcane Liaison Farms.	5
2. Deputy Director of Agriculture (Regional)	1
3. District Agricultural Officers	5
4. Agricultural Depot	24
Total ..	35

III. AGRICULTURAL EDUCATION.

(*a*) *B.Sc.* (*Ag.*) *Degree course.*—The Agricultural Colleges at Coimbatore and Bapatla re-opened after summer vacation on 15th June 1953 for the second and final year B.Sc. (Ag.) classes. The first year B.Sc. (Ag.) students who were selected by the Selection Committee joined the College on 21st July 1953 at Coimbatore and on 20th July 1953 at Bapatla. The number of student in each of the three classes were as follows :—

B.Sc. (Ag.) degree course.	Coimbatore.	Bapatla.
First year	96	79
Second year	86	76
Final year	68	77

The total strength of the First year B.Sc. (Ag.) during 1953–54 was fixed at 96 as in the previous year. Of these, two seats each for the nominees of the Travancore-Cochin State and the Government of Coorg, one seat for a student from Ceylon State and the Government of Coorg, one seat for a student from Ceylon nominated by the Government of India and six seats for the detained and failed students of the First year B.Sc. (Ag.) in 1952–53 were reserved. The selection of the candidates for admission to the B.Sc. (Ag.) degree course of the Agricultural Colleges, Coimbatore and Bapatla was made by a committee constituted by the Government of Madras consisting of two non-official members, viz., Sri. T. S. Venkataraman, KT., C.I.E., D.SC. Retired Sugarcane Expert, Sugarcane Breeding Station, Coimbatore and Sri C. Ramaswami Naidu, M.A. (Cantab), Retired Secretary, Indian Central Tobacco Committee and two official members, viz., Sri R. Balasubramaniam, Principal, Agricultural College and Research Institute, Coimbatore and Dr. Azizuddin, Principal, Madras Veterinary College, Madras. Of a total number of 372 applications received, 317 were interviewed by the Committee and 85 candidates for Coimbatore College and 91 for Bapatla college were selected.

(*b*) *Post-graduate Diploma course in Horticulture.*—The first session of the Horticultural Diploma course leading to the Diploma in Horticulture of the University of Madras commenced at Coimbatore on the 14th August 1953 with twenty-five trainees, of whom twenty were drawn from among the departmental upper subordinates of both the Andhra and Madras States, one nominee of the Hyderabad State and four private candidates. Besides theory and practical classes including laboratory, a programme of special lectures by the Systematic Botanist was also gone through. The trainees were sent on tour for eight days to the Fruit Stations at Kallar and Bulliar, Bhavani Sagar and Tudiyalur.

(*c*) *Short course.*—The short courses in Agriculture and allied subjects could not be run during the year due to the increased admission to the B.Sc. (Ag.), and want of sufficient accommodation in the Hostel; still two candidates were given practical training in Agriculture at the Central Farm for a period of one year from 15th June and 1st July 1953, respectively.

(*d*) *Refresher course in Agriculture for a period of six months.*—In G.O. Ms. No. 491, Food and Agriculture, dated 31st March 1953, Government sanctioned a scheme for running a Refresher course in Agriculture for young farmers between 17 to 25 years for a period of six months in order to give an all-round practical training in Agriculture and allied subjects. The first year course was run from July to December 1953 at the Central Farm. Fourteen trainees consisting of eleven Tamil and three other Malayalee

farmers transferred from Taliparamba centre during September 1953 underwent training in the regional Tamil language under the Agricultural Instructor specially appointed for this course. At the Agricultural College, Bapatla, eighteen young farmers underwent the course.

(*e*) *Students' tour.*—Durine the year, the second year B.Sc. (Ag.) students went on educational tour to Agricultural Research Station, Pattambi, Coconut and Arecanut market yards at Kozhikode, Agricultural Research Station, Taliparamba, Coconut Research Station, Kasargod, and Agricultural Research Station, Mangalore, in two batches.

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

	Coimbatore.			Bapatla.
	First year.	Second year.	Third year.	
(1)	(2)	(3)	(4)	
Agricultural department—				
Backward community ..	5	..	..	20
Muslim	1	..	..	
Merit	2	..	..	
Harijan Welfare department—				
Backward community ..	2	1	2	7
Government of India—				
Scheduled castes	4	..	..	..
Backward classes	11	5	2	7

Scholarships were renewed in the case of eight students in second and final year classes.

College hostels.—The College hostels continued to remain under the control of the Principals as ex-officio Wardens assisted by a Senior Deputy Warden and a Junior Deputy Warden.

The hostel was re-opened on 15th June 1953 for the academic year 1953–54. Vegetarian and one non-vegetarian sections were run. The average number of boarders with average daily rates of each section is given in the statement below.

	Ceimbatore.				Bapatla.			
	Number.	Rate.			Number.	Rate.		
		RS.	A.	P.		RS.	A.	P.
Vegetarian section ..	106	1	6	1	101	1	6	3
Non-vegetarian section ..	118	1	6	6	89	1	6	7

(*k*) *Students' clubs.*—At Coimbatore, the office-bearers of the Students' Club were elected by the students themselves. A meeting of the debating society was held and a programme for the year was laid down. A social service league and a volunteer corps for the college were organized. The members did very good work during the College Day and conference. The Bapatla Students' Club held one general body meeting and two ordinary meetings. The Independence Day was celebrated on 18th August 1954. Students took part in agricultural extension in neighbouring villages.

Visitors.—The following were distinguished visitors to the college :—

(1) Mr. Karl Kamp, Hollywood Film Technician.
(2) Dr. P. R. Deshmukh, Minister for Agriculture, Government of India.
(3) Dr. Nagan Gowda, Minister for Agriculture, Madras.

(4) Sri R. M. Sundaram, Secretary to Government, Food and Agriculture Department, Madras.

IV. SEASON.

South-west monsoon period.—The south-west monsoon commenced rather weak except in East Godavari, West Godavari and Krishna districts, but the rainfall was helpful in starting sowings on a small scale in the rest of the northern districts. Guntur district suffered in July due to drought but irrigation water was available in plenty. Conditions improved considerably in August 1953 when copious widespread rains were received in all the districts except Anantapur. However, the Godavari river experienced unprecedented floods, which caused widespread damage in Polavaram and Narasapur taluks. Arrangements were made for the supply of seed and equipment to the flood-affected areas.

The beginning of the south-west monsoon was rather weak in the southern districts. The monsoon became vigorous in the month of July except in Chingleput district. It became feeble again in August almost throughout the State. In September, conditions improved slightly. On the whole, the rains in the south-west monsoon period were moderately sufficient for agricultural purposes except in the West Coast and districts of Chingleput, North Arcot and Tanjore. But in Tanjore district the difficulty for water was not very keenly experienced due to the letting in of the Cauvery water in the channels. In the West Coast where this monsoon is all important, rains were far below normal for crop production.

Compared to the previous years, the south-west monsoon of 1953 gave some fresh hope to the agriculturists that they would have fairly a normal year. The condition of crops like paddy, sugarcane and plantains improved considerably and the season was quite normal. The rainfall during September was fairly well distributed and crops n general in all districts in the Circars and the Ceded districts were good and the season quite favourable, but floods affected the crops in the Godavari area. Tanks and channels were generally full, supplying copious water for irrigation. Crops did very well in the Central districts of Salem, Coimbatore, and Tiruchirappalli and the area under groundnut, cholam, cotton and tobacco increased. In Chingleput district, however, Swarnavari paddy and dry crops suffered due to the late onset of the south-west monsoon (Vide Appendix).

V. FIVE-YEAR PLAN.

Intensive Cultivation Schemes.

During the period under report, the following intensive cultivation schemes continued under the Five-Year Plan of the Composite State :—

I. *Land development schemes*—
  (*a*) Reclamation of waste lands and old fallows with tractors.
  (*b*) Soil conservation.

II. *Irrigation schemes*—
  (*a*) Oil engine and electric motor pumpsets on hire and purchase systems.
  (*b*) River pumping schemes.
  (*c*) filter point-tube wells.

III. *Distribution of fertilizers*—
  (*a*) Ammonium sulphate.
  (*b*) Super phosphate.

IV. *Distribution of manures*—
  (*a*) Rural compost.
  (*b*) Urban compost.
  (*c*) Green manures.

V. *Distribution of improved seeds*—
  (*a*) Paddy.
  (*b*) Millets.
  (*c*) Pulses.

VI. *Control of pest and diseases of crop.*

The particulars of working of the above schemes are given below :—

I. *Land development schemes.*—(*a*) *Reclamation of waste lands with tractors.*—There were 301 tractors, working in the department as on 1st July 1953 of which 185 were provided with bull dozer attachments. The use of these machinery especially the bull dozer equipment for reclaiming virgin lands and old fallows had been intensified since the inception of the scheme and accordingly there were pressing and steadily mounting demands from all districts for tractors. Departmental tractors were used regularly for ploughing, harrowing and also for puddling and trampling in green manure in wet lands with the new rotavator-attachments, which is gaining greater popularity among ryots. The area covered was 10,525 acres during this quarter.

Besides individual enterprises, big schemes of land cultivation and reclamation as in the Tungabhadra Project and the Kamagoti area, were also taken up by the department.

Bull dozers were also utilized in the clearance of cyclone damaged and flood sand cast areas in the district of Srikakulam, West Godavari, Anantapur, Chittoor, Chingleput, Nellore and Coimbatore.

In addition to these activities departmental tractors fitted with tractor tankers had also to be utilized for supply of drinking water in famine-affected areas of Chittoor and Coimbatore.

Supply of tractors under hire-purchase system.—The scheme for supply of tractors under hire-purchase system continued this year also. This scheme is gaining appreciable popularity among the more enterprising and progressive agriculturists who are keen to have their own tractors according to their own choice but are unable to purchase for cash. During the period under report 13 tractors (particulars are given in Appendix) were supplied under this scheme and they are all being put to very good use by the ryots for various field and haulage operations. While, during the cultivation seasons, they are put to intensive use on the fields for tillage, they are also employed with advantage for haulage of produce and agricultural transport as a regular feature and on a profitable basis by all the owners.

(*b*) *Soil conservation.*—Soil conservation schemes were in progress in the Rayalaseema districts of Bellary, Anantapur and Chittoor and in Coimbatore and Nilgiris districts.

(1) *Soil conservation in Bellary and Anantapur districts.*—The scheme was the earliest to be taken up but for several causes progress

was slow. The areas contour bunded in three centres in these districts remained at—

Hagari	..	1,380 acres.
Alur ..	..	2,040 ,,
Guntakal	..	1,415 ,,

The extension scheme sanctioned by Government in their order No. 166, Development (P. & D.), dated 10th January 1953, to cover 6,650 acres for the three centres in order to complete the entire catchment could not be taken up as the preliminaries could not be completed before September 1953. During the rains received in July, grasses were raised on the contour bunds.

(2) *Soil Conservation Scheme in Chittoor district.*—The Soil Conservation work in Chittoor district was started primarily as a famine relief measure in two centres, Chittoor and Vayalpad. By the end of September 1953, a total area of 3,557·72 acres was contour bunded in the two centres against a target of 4,800 acres. As seasonal conditions improved by then, the work was stopped.

(3) *Soil Conservation Scheme in the Nilgiris.*—The pilot scheme in Ketti valley proved to be a great success and was very impressive. The potato crop in the protected areas yielded 40 per cent more than the crops in the non-protected fields adjoining.

(4) *Soil Conservation Scheme in Coimbatore district.*—This scheme also was started as a famine relief measure in Dharapuram taluk and 708 acres were contour bunded and 272 waste weirs were constructed. On an average, 300 labourers could be employed on the works.

II. *Irrigation schemes—(a) Oil engines and electric motor pumpsets for hire and hire-purchase system.*—To develop power lift irrigation, the Agricultural department had on hand 767 oil engines of the portable type for hiring to ryots. The scheme was popular and there was great demand for oil engines on hire. The demand for oil engines from Madurai district was particularly great due to failure of rains and some units from the neighbouring districts were sent there.

Supply of oil engines and electric motor pumpset on hire-purchase system was also continued as there was keen demand from small ryots to own their own sets. During the period under report six oil engines and 13 electric motor units were acquired for this purpose and supplied.

(*b*) *River Pumping Scheme.*—The river pumping schemes started to provide irrigation facilities for a group of ryots in a village from rivers through big pumping units was continued during the year as they were popular in certain districts. The Pinayur and Nelvoy river pumping schemes in Chingleput district were continued. A new river pumping scheme in Kilithur village in Kumbakonam taluk of Tanjore district was started on 1st July 1953 and irrigation water was supplied for 45 acres. Preliminaries for starting river pumping schemes in Lakkidi, Perur and Lakkidi Pallapuram in Malabar district were completed.

(*c*) *Filter point tube wells.*—A scheme for sinking 600 filter point tube-wells for the year 1952–53 for the composite State could be completed with fitting oil engine pumpsets by 30th September 1953. Five hundred and ninety-five filter points were sunk and these were estimated to have provided irrigation for 5,950 acres giving an additional production of 2,975 tons. These filter points were helpful in giving additional short crops in summer as paddy and were very popular.

III. *Distributionof chemical manures—* (*a*) *Ammonium sulphate.*—From 1950 up to 20th September 1953, this department was functioning as a wholesale distributor by supplying stock of ammonium sulphate from the Central Fertiliser Pool to retail distributing agencies, i.e., co-opera tive societies and tender firms on 50 : 50 basis. This method was disconti nued from 21st September 1953. Direct retail distribution of ammonium sulpha te by this department was allowed on prepayment of cost. Besides, the sale of ammonium sulphate was thrown open to normal trade. Under this arrangement, the dealers and co operatives get their requirements from clearing and forwarding agents at Madras Port. The stocks left with the Agricultural depots were also being sold to the dealers or ryots without any quantitative limit.

(*b*) *Super phosphate.*—The subisdized sale of super phosphate at half cost was continued in 1950–51 and 1951–52. The half subsidy was reduced to 25 per cent with effect from 1st April 1952. This concession also was withdrawn with effect from 15th August 1952 and since this date this department has not purchased any quantity of super phosphate from the manufacturing firms. The small quantity of super phosphate available in the Agricultural depots is being disposed off by sale to ryots directly.

Intensive Manuring Scheme.—In G.O. Ms. No. 155, Food and Agriculture (Food Production), dated 16th April 1953, Government sanctioned the continuance of the scheme for 1953–54 for distributing chemical fertilizers to ryots by giving loans under the Intensive Manuring Scheme. The scheme with an allotment of 1·25 crores was sanctioned for the whole composite State. The object of the scheme is to encourage the ryots to produce more paddy by applying these chemical fertilizers. The scheme is mainly intended for the paddy crops assured with water-supply. The loan was given in the shape of chemical fertilizers. The loan was given at the rate of Rs. 36 per acre and the maximum of Rs. 500 per individual. Interest will be charged on the loans at the rate of 4½ per cent. The loan will be recovered after a long term harvest along with the kist. As the ryots have become more manure minded, the demand for fertilizers has increased considerably. This scheme has helped poor and deserving ryots to get the manures on loan and use the same in their lands for increasing yields of paddy.

The following are the loan amounts disbursed and the quantity of fertilizers distributed under the scheme during the quarter under report :—

Amount actually disbursed	Rs. 1,03,73,289
Ammonium sulphate distributed	44,034 tons.
Super phosphate	5,730 ,,

IV. (*a*) *Rural compost making from waste vegetable matter.*—Government ordered that the compost week should be celebrated along with the National Tree Planting Week (Vanamahotsava). Accordingly, compost week was celebrated in all the districts of this State in the first week of July 1953 in co-operation with the officers of the Revenue and Agricultural departments and Natoinal Extension Scheme. Meetings were also held in different villages and the necessity was impressed on the ryots for preparing more compost. Actual demonstrations of digging pits and preparation of composts by improved methods were conducted wherever possible. Wide publicity was given regarding the award of certificates of merits to those who prepare the maximum compost. Their names were published in the Villagers' Guide and Calendar and the Grow More Food Journals.

No subsidy is granted for compost making from June 1952. The quantity of rural compost prepared during the period under repost was 49,828 tons.

(*b*) *Urban compost.*—The Urban Compost Scheme was in operation under the Inspector of Municipal Councils and Local Boards.

(2) *Expansion of compost work.*—All the municipalities in this State, except Fort Cochin continued to manufacture compost. At the end of August 1953 there were 97 municipalities and 383 notified panchayats manufacturing compost in addition to 74 non-notified panchayats. The progress of compost manufacture is shown in the appendix. A total quantity of 73,467 tons of compost was prepared and 61,530 tons were sold.

Disposal of compost.—The production of compost continued to be satisfactory during the period. But there was a slight fall in the quantity of compost distributed. During the period the Panchayats of Uthamapalayam (Madurai district), Madanapalle (Chittoor district), Tenkasi (Tirunelveli district), Dharapadavedu (North Arcot district) and the Gudiyattam Municipality were permitted by Government to sell the compost manure by public auction.

Celebration of Compost Tree Planting Week, 1953.—The compost week celebrated as usual along with the Tree Planting Week Celebration by almost all the local bodies throughout the State.

Subsidy for compost.—During the month of June 1953 two sums of Rs. 679 and Rs. 865 were sanctioned as subsidy towards the loss incurred by the Tuticorin and Kakinada Municipal Councils respectively on transporting the compost manure at concessional rates by the municipal lorries.

(*c*) *Green manure seed distribution.*—Green manuring of paddy is an important and cheap means of increasing crop production, by raising and maintaining the producing capacity of the soil. Further it supplies organic matter, necessary for all the soils. To meet the shortage of food especially rice, manuring with green leaves ranks foremost in the programme of the department. The green manure crop has usually to be raised in the off-season after paddy harvest, i.e., February-March to May-June. At this time the irrigation canals will be closed and hence the crop will have to depend on rain. The crop has also to be protected against cattle trespass. To overcome these difficulties, Sesbania speciosa, a quick growing leguminous green manure crop, producing abundant foliage, which was successfully multiplied during the past two years has been extensively propagated during the year under report. This is similar to Daincha, in respect of soil requirements but gives much higher yields of green matter. The department has evolved cheap methods of growing in lines in paddy fields along the margins, occupying no extra area of cultivable lands. In extensive rice areas like Tanjore Sesbania speciosa grown on paddy field bunds of the first crop Kuruvai paddy yielded upto 6,000 pounds of green leaf to manure the second crop. Besides as a pure crop it gives 60,000 lb. of green leaf enough to manure ten times the area. The increase in yield ranged about 15 per cent.

During the period under report a quantity of about 54 tons of Sesbania speciosa seeds was sold to the ryots. The area grown was about 200,000 of acres till September 1953.

Besides *sesbania speciosa* small quantities of other green manure seeds like Daincha, Kolinji, Sunnhemp, Pillipesara, etc., were also stocked and sold to ryots.

Government sanctioned the continuance of the scheme for the award of prizes and rolling cups for intensifying the cultivation of green manure trees and shrubs up to the end of 1953–54 in G.O. Ms. No. 336, Food and Agriculture (Food Production), dated 19th August 1953.

V. *Distribution of improved seeds*—(*a*) *Paddy.*—This item of work occupies a high place in the Grow More Food Campaign. The increase in yield on account of the utilization of improved seeds is estimated at 10 to 15 per cent over the local seeds. The department has so far evolved about 180 improved strains of paddy suited for different districts and different local conditions and seasons. Some of these are cosmopolitan strains useful for many districts and conditions. Strains largely in demand are multiplied and distributed to farmers so that they could use pure improved strains and step up food production. Nucleus seed of the improved strains produced in the Agricultural Research Stations are multiplied first in 'primary' and next in 'secondary' seed farms in ryots' holdings. Expenditure on supervision of seed farms, roguing charges and premium to seed farm ryots is met by Government. Seed procured from secondary seed farms are stocked in several departmental depots for general distribution to ryots. 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. Half the premium paid to the seed farm ryot is recovered through sales and the balance subsidized by Government.

The scheme for the distribution of improved seeds, through village co-operatives was in operation in the districts of East Godavari, West Godavari, Nellore, Guntur, South Visakhapatnam, Srikakulam, Krishna, Kurnool, Tirunelveli, Madurai, Coimbatore, South Kanara, Malabar, Tanjore, Tiruchirappalli and South Arcot.

The system of seed exchange by which ordinary varieties are exchanged for improved seed was working in the four selected districts of Chittoor, North Arcot, South Arcot and Chingleput.

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

Primary—3,130 acres.

Secondary—10,343 acres.

A quantity of about 389 tons of paddy was procured and a quantity of about 1,684 tons was distributed during the period. This covered an area of about 75,780 acres estimated to give an additional production of 5,075 tons and the economic gain to the State was estimated to be Rs. 17,76,250.

(*b*) *Distribution of improved millet seeds.*—The distribution of improved millet seeds like Sorghum, Ragi, Cumbu, Tenai formed an important item of seed farms as shown below were run during the period :—

Millets—

Primary—672 acres.

Secondary—1,718 acres.

A quantity of 22¼ tons of improved millet seeds was procured and a quantity of 163 tons was distributed during the period. This covered an area of about 24,450 acres estimated to give an additional production of 1,392 tons and the economic gain to the State was estimated to be Rs. 5,84,640.

(*c*) *Distribution of improved strains of pulses.*—Seed farms as shown below were run for pulses during the period :—

Primary	.. ..	34 acres.
Secondary	.. ..	112 ,,

Three hundred and fifty-seven pounds were procured and 364 pounds were distributed during the period.

VI. *Control of pests and diseases of crops (Plant Protection Service).*—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 for the State and two plant protection assistants for each of the districts helped by a trained maistri and messenger. Insecticides and fungicides were stocked in all Agricultural depot for sale and sold to ryots at 75 per cent of the cost generally. Sprayers and dusters for use in application were also stocked and issued free for use. Plant Protection Service has become very useful and popular. There is greater and greater demand from the public for this service.

Among the crop pests, paddy pests received the major attention of the plant protection staff. The army worm, jassids, grasshoppers, root grubs, stem borers, rice bug hispa, and field rats were tackled. The millets' pests—Ear head bug, cut worm, gram caterpillar, flea beetle, grass hoppers, vegetable pests—Epilachna, cutworms, potato tuber moth, pumpkin beetles, oilseeds pests—the red hairy caterpillar and 'surul', rhinoceros beetle on palms and chilli thrips, sugarcane borers and Aleurodids were some of the important pests tackled.

Biological control work against coconut black-headed caterpillar (Nephantis sp.) in South Kanara, Malabar, East and West Godavari districts was in operation. Over 6 lakhs of parasites were released.

There was no serious outbreak of any fungus diseases in this period but blast in paddy, smut of cholam smut on sugarcane, damping off in chillies and tobacco, betelvine wilt, turmeric leafspot, citrus diseases and vegetable diseases received attention.

During the period under report 140,132 acres of food crops, 20,652 acres of other crops, 81,630 fruit and other economic plants were given treatment against pest and diseases and about 5,727 tons of food grain have been estimated to have been saved by the timely adoption of plant protection measures resulting in a monetary gain of Rs. 22,90,800.

VI. COMMUNITY PROJECTS.

The Community Development programmes are in operation in the four community projects launched in 1952–53 and detailed below:—

(1) Godavari Project—Peddapuram, Ramachandrapuram and Kakinada taluks.

(2) Cuddapah, Kurnool Canal Project.

(3) Lower Bhavani Project—Part of Gobichettipalayam, Erode, Bhavani and Dharapuram taluk in Coimbatore district and three villages in Karur taluk of Tiruchirappalli district.

(4) Malampuzha Project—Palghat taluk in Malabar district.

(5) Periar Project—Parts of Melur, Nilakottai and Madurai taluks in Madurai district.

(6) South Kanara Project—Karkal, Mangalore and of Coondapur taluk of South Kanara district.

Details of work done in respect of Agriculture are given in Part II of the report.

VII. RURAL WELFARE SCHEME (NATIONAL EXTENSION SERVICE).

The Rural Welfare Scheme continued to be in operation in the selected firkas as in 1952–53. The department lent the services of fieldmen (84) and maistries (168). Manures, agricultural implements, paddy and other improved seeds and insecticides and fungicides were sold to ryots as in other areas. This scheme got merged in the scheme of National Extension Service Blocks as per G.O. No. 1232, Agriculture, dated 15th April 1954.

VIII. COTTON EXTENSION PLAN, 1953–54 (*Part I*).

The Cotton Extension Scheme was commenced in June 1950 under the Integrated Production Plan of the Government of India. The scheme was included in the National Five-Year Plan from 1951–52 and the work under report was in the fourth year under the Cotton Extension Plan and third year under the National Five-Year Plan.

Work done under the Cotton Extension Plant.—The different items of the Cotton Extension Plan approved and adopted for the Madras State for the 1953–54 season are as follows:—

(i) Cultivation of cotton in newly reclaimed waste lands and fallow lands.

(ii) Extension of area by replacement of other non-food crops like ground nut.

(iii) Double cropping—cultivation of cotton in rice fallows.

(iv) Inter-cropping of cotton with—

(*a*) Unirrigated groundnut and chilli.

(*b*) Irrigated groundnut and ragi.

(*c*) Inter-crops in coconut topes, banana gardens and other fruit gardens.

(v) Distribution of improved seeds.

(vi) Application of fertilizers.

(vii) Adoption of plant protection measures.

(viii) Improved cultivation methods.

Targets of area and production for 1953–54 were fixed for each district and taluk under the various approved items.

Besides the items of the approved plan detailed above, Moco cotton was recommended to be grown as a perennial plant in school gardens, house compounds, community project areas, etc.

Procurement and distribution of improved seeds.—The following quantities of seeds of improved varieties of cotton were procured and distributed in the State during the period:—

Variety.	Quantity targetted for 1953–54. MDS.	Quantity procured. MDS.	Quantity distributed. MDS.
Cambodia 2	4,500	373	316
Madras Cambodia Uganda 1.	15,000	8,937	2,889
Karunganni 2 ..	14,000	208	56
Karunganni 5 ..	7,000	4,517	1,009
Westerns 1	11,000	..	1,284
Cocanadas	1,500	..	..
Laxmi	1,500	..	..
881 F	500	..	..

The quantities distributed include also the balance of previous year's procurement distributed during the current period.

The targetted quantities of K 2 and K 5 could not be procured due to adverse seasonal conditions in 1952–53 particularly in the southern districts of Ramanathapuram and Tirunelveli districts. With reference to Cambodia Co. 2 the procurement was limited to a small quantity as this is to be replaced by a superior variety M.C.U. in most of the areas where Cambodia is grown.

Achievements of area and production under the plan of cotton extension.—The total area targetted to be covered by the different items of the Cotton Extension Plan was 108,000 acres and the total production targetted 77,385 bales of 392 lb. lint. The area reported to be achieved during the period and the production, were estimated at 17,954 acres and 6,214 bales respectively.

A correct estimate of the achievements could be had only by the end of March 1954 by which time the sowing of cotton during the fasli is expected to be almost completed.

IX. RESEARCH.

The research work of the department is carried on mainly at the Agricultural Research Institute and the breeding stations attached to that institute at Coimbatore as well as at the 50 Agricultural Research Stations and regional research centres throughout the State. The review of research work done under report is presented below under the following heads :—

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

1. RESEARCH COUNCIL.

The Research Council consists of the heads of different research sections with the Principal and Vice-Principal of the Agricultural College, Coimbatore, as President and Secretary respectively. It scrutinizes the programmes of work and progress reports on research work done at all centres. Ten meetings of the council were held for scrutiny of research programmes, progress reports and miscellaneous items pertaining to research.

2. AGRICULTURAL CHEMISTRY.

Analytical and Advisory.—This branch of the section has, as usual, been catering to the requirement of ryots, Government Departments, Industrial concerns and the general public by analysing soils, manures, irrigation waters, foodstuffs, fodders, plant materials and other miscellaneous samples and giving advise to the parties on their samples. Besides the analytical and advisory work referred to above the section continued to do the useful work of answering queries received on matters pertaining to the improvement and maintenance of soil fertility, manuring, feeding of livestock irrigation waters, reclamation of saline and alkaline soils and other allied subjects.

In the beginning of the year there were 2,152 samples pending analysis. Most of these were departmental samples of soils and plant materials. During the period under report 583 samples were received and registered and 927 samples were analysed and reported. The samples received and disposed of may be broadly classified as indicated below according to their nature and sources of receipt.

	Receipts.				Disposals.			
	Agricultural department.	Other Government departments.	Private and manure firms.	Total.	Agricultural department.	Other Government departments.	Private and manure firms.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Soils	107	1	15	123	298	11	16	325
Plant materials (permanent manurials).	50	..	..	50	92	..	..	92
Manures	67	16	28	111	75	15	24	114
Foods and feeding stuffs and plant products.	225	58	..	283	325	55	..	380
Waters	1	2	13	16	1	2	13	16
Total	450	77	56	583	791	83	53	927

The receipt by way of analysis fees amounted to Rs. 723 for the first three months of the year.

Research Schemes.—The following research schemes and other research items as per Three-year Programme were in progress and the results are detailed in part II of the report :—

(1) Stewart's Manurial and Soil Survey Scheme, Tanjore—Indian Council of Agricultural Research.
(2) Soil Survey Scheme—T.C.M. Scheme.
(3) Agronomic studies on rice crop—T.C.M. Scheme.
(4) Storage of Fertilisers—T.C.M. Scheme.

3. AGRICULTURAL ENTOMOLOGY.

Research.—Research work was continued on the lines indicated in the three-year Programme (1954–56). A gist of the work done on controlling pests is given below :—

(*a*) *Pests of paddy*—(i) *The paddy stem-borer* (*Schoenobius incertellus, Wlk*).—Studies on the control of this pest were continued at the Agricultural Research Station, Aduthurai. The incidence of the stem-borer was on the whole very mild on the Kuruvai crop.

(ii) *The paddy meely bug* (*Ripersia oryzae, Gr.*)—There was practically no incidence of this pest on the 'Kuruvai' crop at the Agricultural Research Station, Aduthurai.

(iii) *Field rats* (*Bandicota bengalensis G and K. Millardis meltada G.*)—Baiting trials with zinc phosphide were continued at the Agricultural Research Station, Aduthurai. The percentage of consumption varied from 40 to 60 during the period under report. Other mechanical measures of control like, setting up of bow traps, digging and catching were continued.

(*b*) *Pest of vegetables*—(i) *The little leaf disease of brinjal and the vein clearing disease of Bhendai.*—Experiments on the control of virus disease by tackling the insect vectors were undertaken.

(*c*) *Pests of cotton.*—At the Agricultural Research Station, Aduthurai, the efficacy of repeated applications of BHC, Parathion and Gammalin in the control of the spotted bollworms of cotton *Earias* sp. were studied. Parathion spray 0·025 per cent gave the best results.

(*d*) *Pests of stores products*—(i) *The effects of mixing synthetic chemicals and other insecticides with seed materials.*—Observations were continued in the set of experiments started on 25th May 1953. The seed treatments consisted of DDT. 10 per cent dust and Lindane 0·65 per cent dust, acorous and sulphur dusts at different dosages varying from 1 : 100 to 1 : 500 parts of seeds by weight.

(ii) A timely fumigation with calcium cyanide and external dusting of the bags with Lindane 0·65 per cent at periodical intervals were found to keep off the infestation of *Lasioderma serricorne* F (a pest on stored product) on dry ginger.

(iii) *Fumigation of oil-seeds with Methyl Bromide and Killopetera.*—Studies on the fumigation of oil-seeds with the abovementioned chemicals were continued with reference to niger, safflower, linseed, mustard and tobacco.

(*e*) *Work on insecticides and fumigants.*—Research was carried on into the adverse effects of the synthetic chemicals with reference to cucurbits. The experiments were just started during the period under report. As the incidence of the crop pests was mild during this season (July to September) no intensive work could be done on the trial of proprietary preparations of pesticides.

Biological control.—The mass rearing of the Australian predator beetle *Cryptolaemus montrouzieri Muls* was continued. A total of 21,077 beetles were reared out of which 12,000 adults were despatched for liberation in various infested localities. The nucleous stock of the parasites of *Nephantis serionopa* M was maintained.

Sugarcane borer pest scheme (*Financed by the Indian Central Sugarcane Committee*).—Observations on the influence of weather factors on borer population were continued with reference to the sugarcane crop planted in April 1953. The percentage of infestation by early shootborer recorded at the end of the July was 22·4, 18·8 and 19·7 respectively with Co. 413, 419 and 421. Studies on the alternative host plants were also pursued.

(*f*) *Bee-keeping.*—Research on the improvement of the honey gathering capacity of *Apis indica* F was in progress under a special scheme financed by the Indian Council of Agricultural Research. The work was continued as per programme. As the season was slack and lean for bees only observations of a routine nature were carried out with reference to the different items of work in the approved programme.

(*g*) *Systematic work.*—Systematic work on a few important groups of insects were continued.

(*h*) *Fundamental work.*—Studies on the bionomics of important coccinellids were continued.

(*i*) *Plant quarantine work.*—The plant quarantine work was attended to at Mettupalayam and Shembaganur.

4. Agricultural Mycology.

1. *Studies on Pythiaccous fungi.*—The investigation of diseases caused by these fungi and evolution of control methods, were in progress since 1939. A root rot of Papaya caused by *Pythium aphaindermatum* could be effectively controlled by drenching the soil with Bordeaux mixture. This information was passed on to the Plant Protection staff for adoption.

2. *Rice disease*– (*a*) *Blast* (Piricularia oryzae).—The research was in progress since 1943 with the object of devising different methods of control of the disease and for evolution of varieties and strains resistant to 'Blast'. One hundred and eight cultures were found to be resistant to blast in trials at three centres, Coimbatore, Buchireddipalayam and Aduthurai. The work is being continued to fix suitable strains.

(*b*) *Foot rot* (Fusarium moniliforme *var.* Majus).—Research on suitable control measures for the disease was in progress since 1943. Organomercuric compounds were found effective and seed treatment with these was already recommended and adopted by ryots.

(*c*) *Stem rot* (Sclorotium oryzae).—Investigations to find out the conditions favouring the disease and to select resistant cultures of rice were in progress since 1949. Paddy varieties ADT. 3, ADT. 9, ADT. 20 were found to be highly susceptible. The incidence of jassids and Fulgorids favoured the onset of stem rot disease. Studies are continued.

3. *Ragi blast* (Piricularia sp.).—Selection of disease resistant varieties was in progress since 1948. Thirty-five selections of ragi were tested but so far none was found to be resistant. Work is still in progress.

4. *Cereal rusts*—(*a*) *Wheat rusts* (Puccinia graminis, P. triticinia, P. glumarum).—Selection work for evolution of rust resistant wheat was in progress since 1947. Variety GAB. which was promising is under distribution in the Nilgiris. Another variety Konphad 28 is also found promising and will be tested in the districts.

(*b*) *Sorghum rust* (Puccinia purpurea).—Research is directed to assessment of varietal reaction of different cultures of Sorghum to this rust and determination of alternate and collateral hosts. Work was in progress since 1949. Fifteen cultures were found to be resistant even under artificial inoculation. The work is to be continued.

(*c*) *Cumbu rust* (Puccinia penniseti).—Work was in progress since 1947 for assessment of the relative reaction of different varieties and search for collateral hosts. All agronomically useful cultures were found to be susceptible.

(*d*) *Tenai rust* (Uronyces setariae).—Six Japanese varieties tried, were found to be resistant to this rust disease.

(*e*) *Cotton Blackarm* (Xanthomonas malvacearum).—Research for selection of Blackarm resistance and determination of effective fungicidal treatment for controlling the disease was in progress since 1939. Sixty selected cultures were tested so far. Seed treatment with organo-mercury

compounds was found effective in controlling seed borne infection. The results have been passed on to the Plant Protection staff.

(*f*) *Vegetable diseases—Root rot and wilt.*—Research for control measures and evolution of resistant varieties was in progress since 1949. The brinjal variety, Black Beauty 16 was found to be resistant.

(*g*) *Orange diseases.*—Research to study the etiology of the disease and evolution of control measures was in progress. Application of manures to the soil and foliage sprays with urea improved the condition of the declining orange trees. These measures were recommended and demonstrated for adoption in Wynaad.

(*h*) *Potato virus disease.*— Production of disease free seed was in progress during the year. Great Scot variety grown in the Ergot Farm was carefully inspected and rogued to eradicate all virus diseases. The disease free seed material will be multiplied for distribution to growers. This work will produce increased yields as disease free seed material will be supplied.

(*i*) *Areca stem breaking disease.*—To find out the causes for this disease investigations are in progress under a scheme partly financed by the Indian Central Areca Committee. Research so far has indicated that tissues and cavities in the stems develop due to exposure to sun initially and later, entry of fungal wound parasites.

(*j*) *Ergot of rye.*—Trials at production of Ergot were in progress since 1944. At the Ergot Farm, Ergot production was continued and about 85 acres have been sown.

(*k*) *Plant quarantine work.*—Seeds and plant material intended for export were examined and phyto-sanitary certificates issued.

5. Agricultural Meteorology.

The object of the Agricultural Meteorology Section, Coimbatore, as a permanent wing of the Madras Agricultural Department, is to collect data on the influence of climatic factors on crop growth and yield and also on the incidence of pests and diseases on crops. Long range collection of data is essential before the incidence of pests and diseases on crops, from a knowledge of the existing weather conditions, is attempted to be forecast with a fair degree of success.

Main lines of research pursued.

1. Collection of Meteorological data and micro-climatic data at 7·00 hours and 14·00 hours daily was attended to regularly.

2. The crop weather experiments under the All-India Co-ordinated Crop Weather Scheme were conducted for the sixth year in succession at six Agricultural Research Stations on the crops as detailed below :—

(*a*) Coimbatore—Cholam, Cotton and Paddy.
(*b*) Aduthurai—Paddy (two crops).
(*c*) Pattambi—Paddy (two crops).
(*d*) Koilpatti—Cotton and Cumbu.
(*e*) Hagari—Cholam and Cotton.
(*f*) Samalkot—Paddy and Sugarcane.

Observations on the above crops along with micro-climatic observations and soil moisture estimations were regularly attended to as per the programme drawn up by the Director of Agricultural Meteorology, Poona. Observations on pests and diseases were also recorded periodically on the above crops and the data were submitted to the Director of Agricultural Meteorology, Poona, for scrutiny and analysis.

3. *Statistical analysis.*—This was done for study of the effect of meteorological elements on crops, pests and diseases, growth conditions, etc., studies in collaboration with the Government Entomologist and Mycologist, Coimbatore, in the prediction of outbreak of pests and diseases, on crops are in progress.

Study of crop climate relationship.—To collect precise data on the influence of the various meteorological factors on the growth of Cholam crop, systematic data were collected on height, number of tillers, number of fully opened leaves and number of internodes on 24 plants selected at random in each of the two varieties of cholam, viz., Co. 1 and Co. 3 in the Central Farm.

The collection of data on crops and weather is to be done systematically for a long period of at least two decades before aiming in actual practice, forecast of crops and incidence of pests and diseases with a fair amount of success. With the above aims in view elaborate data are being systematically collected in order to analyse the data statistically and interpret the results when sufficient data for at least twenty years have been collected.

6. Crop Improvement Work.

(*a*) *Paddy.*

Research.—Pure line selection for evolution of high yielding strains has been in progress for a long time. Research in deep water paddy varieties was taken up from 1952 and evolution of blast resistant varieties was taken up from 1943. Evolution of smut resistant and saline resistant strains is under way. Crosses between *Japonica X indica* received from the Central Rice Research Institute, Cuttack, are under study.

In Pedda Attragada, two cultures 4250 and 4280 were found superior to ryots' bulk. The culture 5059 from Tirurkuppam has done well at Deep-water Research Station at Pulla in the second-crop season.

Hybridization.—Hybridization work for inducing flood resistance, drought resistance, blast resistance and saline resistance was continued. One flood resistant culture, one saline resistant culture and three smut resistances were found promising. Further work is necessary till strains are released.

Agronomic trials—Manurial trials.—To test the efficiancy of the method of application of phosphatic manures an experiment was in progress since 1949–50. Application of phosphates through a green manure crop appears to give better result. With further confirmation the practice will be recommended for general adoption.

In the trial green versus air-dried Sesbania, the former treatment outyielded the latter in Samalkota.

(*b*) *Millets and pulses.*

Research.—Work for breediug improved strains of millets and pulses was continued at Coimbatore and at the regional centres of work situated in the different parts of the undivided Madras State. The results achieved from the experiments on the irrigated crops Cholam, Cumbu and Ragi at Coimbatore and the Mungari crops of Jonna and Korra carried on at the

Agricultural Research Stations, Siruguppa, Hagari and Nandyal during the period under report are presented below :—

Millets.

(*a*) *Cholam.*—One high yielding selection of Talaivirichan Cholam was given station number as Co. 19. This is expected to cover an area of 30,000 acres. In the irrigated Sen Cholam, two bold grained selections and three juicy selections from the progenies of crosses as well as two high yielding selections from the progenies of crosses, were advanced to yield trials. Two selections, A.S. 8155 Kottaivellai Cholam, Madurai and A.S. 8159 a juicy selection of Vellai Cholam, isolated from crosses, were given station numbers as Co. 17 and Co. 18 respectively. It is estimated that these two strains are capable of spreading over an area of about 40,000 acres. Fourteen selections of vellai cholam have been brought to yield trials. In the short duration (80–85 days) group of vellai cholam, a selection A.S. 8388 which had given consistently good performance was issued for trials in the districts. Selections A.S. 8001 and A.S. 8002 of periamanjal gave 13 and 34 per cent higher yields, respectively over the local varieties in trials in Ariyalur taluk of Tiruchirappalli district. These and a juicy selection A.S. 8112 of the same variety recorded 7 to 8 per cent increased yields over Co. 1. in Coimbatore taluk. Selection J. 5 found superior to strain G. 2. and the local pyru jonna in yield trials in two out of three years of trial at Ongole was given out for trials in Krishna and Guntur districts. This selection had the additional advantage of having juicy sweet (cheruku) stalks. Four high yielding selections of tella jonna J. 718, J. 744, J. 761 and J. 762 were issued for trials in Bellary and Anantapur districts from Agricultural Research Station, Hagari. At Siruguppa, irrigated vellai cholam strain Co. 9 was found suitable for cultivation in the mungari season. From eight selections of Tenkasi found promising 169 single plants were taken for further trials. The mungari patcha jonna strains N. 10, N. 11, and N. 12 were under multiplication at Nandyal.

Striga resistant cholam strains.—The evolution of cholam strains resistant to root parasite striga, was in progress at Nandyal, Hagari, Lam, and Coimbatore since 1949. Nine selections of periamanjal, resistant to the parasite and at the same time superior to Co. 1 in grain yields, were advanced to yield trials. These have been sown in yield trials in both striga-sick and striga-free fields to test their performance under different conditions. Twelve selections apparently resistance to striga and 44 selections from the F. 1, F. 2, and F. 3 progenies of crosses between strains N. 1, N. 2 and N. 3 and the resistant type A.S. 4003 (Bongonhilo) have been sown to test their tolerance at Nandyal. Work has to be continued further till superior resistant strains are obtained.

(*b*) *Cumbu.*—The work on the evolution of high yielding hybrids under a scheme financed by the Indian Council of Agricultural Research was continued since 1946. Seventy-three inbred lines advanced from previous years were studied in observation plots. Thirteen new crosses between early generation inbreds and 48 topcrosses of inbreds with variety Co. 3 were effected. Twelve hybrids of short duration were tested in final yield trials. At Koilpatti, eight hybrids were sown in preliminary yield trials in redsoil area under irrigation in comparison with strain K. 1. Three selections of arisi cumbu (early season variety) superior to the local have been isolated for final yield trials at Ariyalur. Two promising selections have been advanced for yield trials at Tiruppattur. At Narasapatnam,

30 promising selections and 6 hybrids that were tested in the previous year were again sown in yield trials in comparison with local. In district trials, selection P.T. 866 and P.T. 868 were found suitable to Chittoor district, P.T. 833 to parts of Krishna, Chingleput, Salem, Tanjore and Ramanathapuram and P.T. 863 was found superior to the local variety in Vinukonda taluk of Guntur district. The hybrids X. 1 and X 2 were found suited to Srikakulam, parts of Bellary, Tiruchirappalli and Tirunelveli districts. Work has to be continued till strains suited to thedifferent regions are evolved and released.

(*c*) *Ragi.*—From 23 selections of short duration under study at Coimbatore, 12 were advanced to preliminary yield trials. At Palur, 200 single plants were studied in observation plots. Four selections from crosses between strain K. 1 and K.R. 4, to combine the high yield of the former and the non-lodging habit of the latter, were tested in preliminary yield trials at Koilpatti. Twelve selections of the early season (punasa) ragi were sown in yield trials and eight selections in preliminary yield trials in comparison with strain A.K.P. 2 at Narasapatnam. Selections E.C. 4573., E.C. 4310 and H. 1 and high-yielding selections R. 4 and R. 78 were tested in observation plots to choose the best of these both at Hagari and Siruguppa.

(*d*) *Tenai.*—Strain Co. 1 recorded increased yields ranging from 22 to 24 per cent over the local in Madurai and Coimbatore districts. Strain Co. 2 gave 18 to 120 per cent increased yields in Coimbatore and South Arcot districts, while Co. 3 recorded 8 per cent increase in Madurai district. Nine high-yielding selections were tested in yield trials in comparison with H. 1 and H. 2 at Hagari. N. 1 of Korra was multiplied at Nandyal.

(*e*) *Minor millets.*—Strain Co. 1 of varagu was found suited to Ramanathapuram, North Arcot, South Arcot and Chingleput districts.

Pulses.

Three fresh types of redgram, four of bengalgram, five of cowpea and one in each soyabean, greengram and blackgram, totalling 15 fresh samples were collected. Quantity of seeds of improved strains of millets and pulses distributed, area covered, additional production estimated, etc., are given below :—

Crops.	Quantity distributed in pounds.
1. Cholam	5,231
2. Cumbu	2,023
3. Ragi	810
4. Tenai	300
5. Minor millets	392
6. Pulses	343
Total ..	9,099

The improved seeds distributed are expected to cover about 1,100 acres next season.

(c) *Oilseed crops.*

Groundnut (1953 *summer*)—(i) *Mixed cropping experiment.*—To find out the best mixed cropping with groundnut under irrigation a trial laid out in 1953 summer at the Agricultural Research Station, Palur, showed that groundnut grown mixed with ragi and cotton gave the highest monetary return over these crops grown either pure or in any other combination. These trials are to be continued for confirmatory results.

(ii) *Spacing trial.*—To determine the optimum spacing an experiment was laid out in 1953 summer adopting five different spacing for the bunch and spreading types. The spacing of 9" X 6" for the bunch type gave the highest yield and the maximum monetary return. No conclusive result was obtained in the case of the spreading type. The experiment has been repeated during 1954 summer. The crop has not yet been harvested.

(iii) *Irrigation experiment.*—To determine the optimum interval between irrigations, this experiment was also laid out in 1953 summer with four intervals of irrigation. The results showed that irrigating the summer crop of groundnut every tenth day recorded the highest yield. Results are to be got confirmed, by further trials.

Gingelly 1953 *summer* (*irrigated*) *crop*—(i) *Trial of selections for evolution of high yielding strains with good quality.*—Two selections from varieties and four colour grade selections isolated from T.M.V. 1 strain, were compared with the local, T.M.V. 1 and T.M.V. 3 strains. The yield differences were not statistically significant.

(ii) *New varieties.*—Eleven new varieties received from the U.S.A. were raised and studied. Six of them had desirable characters like 1 to 3 capsules per leaf axil and very compact setting of capsules. They will be of value in breeding work on this crop.

(iii) *Spacing trial.*—The experiment to determine the optimum spacing for gingelly was repeated on the same lines as last year and it was found that a spacing of 1′ × 1′ for summer gingelly grown under irrigation is the optimum.

(iv) *Time of sowing experiment.*—The experiment to determine the optimum time of sowing was repeated. It was found that early sowing of summer gingelly in February ensures better growth, flowering, fruiting and yield than late sowings in March and April. Results are to be confirmed by further trials before passing on to cultivators.

(v) *Hybridisation.*—Hybridisation work in gingelly which was initiated in 1950-51 was continued with the object of evolving (*a*) a white-seeded strain and (*b*) a cosmopolitan type and (*c*) combining all the desirable qualities in one and the same strain.

Seed multiplication schemes—(i) *Comprehensive Coconut Nursery Scheme.*—A total of 171,952 seednuts were planted in the 1953 nursery at Nileshwar, Pattambi, Pattukkottai, and Samalkot centres, which included 4,066 seednuts collected from 205 select mother palms for the progeny study. During the three months period 97,281 seedlings were supplied to the public from the 1952 nursery. In addition, 1,566 seedlings raised from seednuts collected from select mother palms were plantedin 18 holdings during 1953 season.

(ii) *Coconut nursery scheme at Marudur* (*Tiruchirappalli district.*—In the 1953 nursery, 8,000 seednuts were planted during July-August 1953 including 597 seednuts for progeny study. A total of 5,452 seedlings were distributed from the 1952 nursery. Ninety-seven of these seedlings being the progeny of select mother palms were planted in a ryot's garden for study.

(iii) *Scheme for multiplication of improved strains of groundnut and castor.*—This Five-year Scheme financed jointly by the Indian Central Oilseeds Committee and the State Government was commenced on 29th December 1951 with the object of maintaining a regular supply of nucleus seeds of the improved strains of groundnut and castor to the departmental officers for organizing their multiplication and distribution on a large scale. Six zonal nucleus seed farms were organized at Polachi, Salem, Srivilliputtur, Tindivanam, Vayalpad and Adoni representing the different tracts of the State. A total area of 279·81 acres were sown to the four groundnut strains, and 20·00 acres were sown to the four groundnut strains, and 20·00 acres to the two castor strains at these six centres before the end of September 1953.

Seed distribution.—The quantities of improved seeds and seedlings distributed, area covered, additional production estimated, etc., during July to September 1953, are given below :—

	Quantity distributed.	Area covered.	Additional production estimated.	Economic gains.
	LB.	ACS.	TONS.	RS.
1 Groundnut pods	10,010	105	8	3,750
2 Groundnut kernels	952			
3 Gingelly	207	50	1	1,500
4 Castor	458	45	2	1,750
5 Coconut seedlings	104,240 (Nos.)	1,490	660 (copras)	2,70,000

(d) *Cotton.*

I. Research.—Comprehensive work is done in Madras towards cotton improvement, including in its scope, problems of yield and quality and building up of resistance to pests and diseases and drought in all the important commercial varieties of cotton cultivated in the State. Apart from the existing commercial cotton zones, new areas like off-season fallows in rice areas of Tanjore delta and Coastal districts of Malabar and South Kanara are being tackled for the introduction and cultivation of suitable American and Sea Island cottons, respectively.

The maintenance of purity, multiplication and distribution of improved strains also engage attention under special schemes run for the purpose. One other important item of work consists of certification under a separate organization of superior cottons (Madras Cambodia Uganda-1 and Madras Cambodia Uganda-2) exempted from price control by the Textile Commissioner, Bombay.

Most of the research items mentioned above are being tackled under separate schemes financed partly by the Indian Central Cotton Committee and partly by the State Government. The salient features of progress of research during the period under report is given below :—

1. *Irrigated Winter Cambodia* (*Cotton Breeding Station, Coimbatore and Cotton Breeding Centres, Avanashi and Tiruchengode*).—The object of this item of research is the evolution of a long staple American Cotton variety with a minimum staple of 1-1/16" ginning percentage of 38 and suited for cultivation under irrigation in the cambodia cotton growing areas of the Central and Southern districts of Madras State. Most desirable progenies possessing over 1" staple numbering 429 have been arranged to be tested in progeny rows. Replicated seed nucleus plots for the most promising

culture on hand, viz., 9030 have been raised for assessment and maintenance of purity. Further, selections of derivatives of crosses with Deltapine 32 and U.A. 33 which need special mention with 38 per cent ginning have also been raised for study in lower stages of breeding.

2. *Irrigated Summer Cambodia (Cotton Research Centre, Srivilliputtur and Agricultural Research Station, Palur).*—The objective aimed at with this item of research is the evolution of early maturing cottons of long staple (1–1/8″ and above) suited for summer tract and the evolution of *barbadense* varieties or their hybrids suitable for cultivation in the coastal belts of South Arcot district. Three cultures have been arranged to be tested for the first time on cultivator's holdings to test their adaptability level. In the bulk yield trials, ten cultures are being tested against Madras Cambodia Uganda-1.

In the South Arcot district, ten scattered block trials have been arranged to be conducted with Madras Cambodia Uganda-2 and Madras Cambodia Uganda-1. The time of sowing trial is also being pursued to find out whether cotton can be cultivated in the winter season also.

3. *Cambodia Breeding Scheme (Agricultural Research Station, Siruguppa with sub-stations at Agricultural Research Station, Hagari and Nandyal).*—This item of research is aimed at the evolution of an irrigated American cotton type, suitable for cultivation in the *Hingari* season under the Tungabhadra project and also the evolution of a suitable Cambodia type for rainfed cultivation in the black soils of the Ceded districts growing *desi* cottons at present. From the material on hand, nine best cultures were arranged to be tested under bulk yield trial. Thirteen cultures noted to be resistant to *blackarm* and nine observed to be resistant to *jassids* have been raised for study of relative resistance in comparison to M.A. 2 and Laxmi. Two manurial trials, one to find out the optimum and economic dose of nitrogen required for cotton in the irrigated blacksoils of Siruguppa and the other to find out, whether there is loss in nitrogen when nitrogenous manures are applied to alkaline soils have been laid out. Four promising cultures are being tested in a bulk trial at Nandyal. Seventy scattered block trials with strains, Laxmi and M.A. 2 were arranged to be tested in the districts of Bellary, Anantapur, Cuddapah and Kurnool to compare their yields with local cotton.

4. *Unirrigated American cotton for the Central and Southern districts (Cotton Research Centre, Periyakulam).*—This item of research work seeks the evolution of a strain of Cambodia cotton suitable for growing in the districts of Coimbatore, Salem, Madurai and Tiruchirappalli under rainfed conditions and capable of giving a good yield with a staple of 15/16″ and above. Four cultures have been arranged to be tested in a bulk yield trial to be compared with Madras Cambodia Uganda-2.

5. *Unirrigated Cocanadas (Cotton Research Centre, Narasaraopet and Agricultural Research Station, Lam.)*—The objective of this item of work is the evolution of a medium stapled coloured cotton by effecting conjoint improvement in halo length and lint colour and also to evolve a medium staple white cotton for Cocanadas tract and for the Chinnapathi area. In the Chinnapathi improvement work, three promising cultures are being compared against Anakapalle white in a bulk yield trial. A large number of selections are also being tested in the lower breeding stages against "Anakapalle white" and 197-3. In the coloured Cocanadas work, four

promising varieties were raised in bulk yield trials as a mixed crop with Sajja and also as pure crops with C. 2. and "Palnad bulk" as controls. During the period, seven trial plots with Cocanadas 2 were arranged in the districts of Krishna, Nellore and Kurnool.

6. *Unirrigated mungari (Cotton Research Centre, Adoni).*—The breeding work at this centre has for its objects the isolation of an early variety of cotton with better ginning than 881 F. and possessing the same lint quality. Trial of K. 28 and H. 420 was arranged in the districts on cultivators' holdings in fourteen centres. In the trial of American varieties on the Station, Laxmi and P. 216 F. were observed to be earlier than the local. From the trial of four pure families along with H. 420, 881 F. and local Mungari, H. 420 was found to be earlier than local. Out of the three pure families derived from the strain 881 F, one was advanced to bulk yield trial.

7. *Unirrigated Westerns (Agricultural Research Station, Hagari).*—The object of this item of work is the evolution of a strain of Westerns cotton superior to Westerns 1 in yield and ginning per cent with a basic staple of 13/16 inch. Scattered block trials with 2 Dharwar types, 2–3–68 and 2–3–69 with Westerns 1 as control were arranged in seven centres. Four promising cultures are being tested in a bulk yield trial.

8. *Unirrigated Northerns (Agricultural Research Station, Nandyal).*—This breeding project functions to evolve an adaptable strain equal to N. 14 in lint quality and spinning performance with improvement in yield, through increase in ginning per cent.

Four promising cultures evolved through hybridization and possessing higher ginning of 30 to 33 per cent as compared to 24 per cent for Northerns 14 with spinning capacity equal to it, were arranged in sixteen centres on cultivators' holdings. These four cultures are also being tested in a bulk yield trial on the station.

9. (*a*) *Unirrigated Karunganni (Cotton Breeding Station, Coimbatore).*—The objective aimed at here is the evolution of a Karunganni strain superior to Karunganni 5, the existing strain, in ginning per cent and lint quality. Derivatives of the best culture on hand, viz., 5,341 have been arranged to be raised in replicated seed nucleus plots for assessment of purity. Three other promising cultures are being compared with the culture 5341 in a small bulk trial and a family block.

(*b*) *Unirrigated Tinnevellies (Agricultural Research Station, Koilpatti).*—It is the object of this item of work to evolve strains of Karunganni cotton capable of spinning 40's standard warp counts and suited to the entire rainfed *desi* cotton growing black soil areas of the central and southern districts. Scattered block trials with the four improved cultures, viz., 6186, 6188, 6874 and 6312, capable of spinning 35's to 41's have been arranged to be conducted in 28 holdings spread in the central and southern districts. Ten other cultures await test in a bulk yield trial on the station.

10. *Unirrigated Sea Island cotton (Agricultural Research Stations, Pattambi and Mangalore).*—The research work here aims at the acclimitization of Sea Island, the world's finest cotton, in the West Coast districts of Malabar and South Kanara as a rainfed crop in the "Modan," and "Kumeri" lands. The lint obtained from variety Montserrat grown in the West Coast was found to be suitable for the manufacture of sewing threads in place of imported

Egyptians. Replicated trials are being conducted with crosses of this variety and other varieties of better ginning and optimum quality. In addition, inter specific F-1's between Montserrat and Cambodia are being tested both as seed-sown crops and as ratoons.

11. *Unirrigated Nadam cotton (Cotton Breeding Station, Coimbatore).*—The aim of this item of research is the evolution of an early maturing *desi* type of cotton of medium staple that can replace the existing coarse perennial Nadam cotton which is cultivated on the poor gravelly soils of the Erode taluk of Coimbatore district. Observation plots with the two best cultures on hand were arranged to be laid out at the Agricultural Research Station, Satyamangalam, which is more representative of the Nadam zone. These will be compared with the local Nadam cotton. The purity of both these cultures are being maintained and studied at Coimbatore.

12. *Perennial cottons (Cotton Breeding Station, Coimbatore).*—The research work on perennial cottons aims at the selection of suitable types of perennial cottons which can be easily grown in backyards of houses, vacant sites, along bunds and water-courses and, in fact, every waste area whereby production of raw cotton is increased without encroaching on food-crop area. The existing type under distribution, viz., Moco, was found to be heterozygous and its purification has been taken up. Other varieties received mostly from Brazil are also being studied.

13. *Wild cottons.*—Under this item of work, it is aimed to fortify the cultivated types with new genes that impart resistance to diseases and pests and possess fineness of lint by transference of such genes from the wild cotton types. Progeny row trials have been arranged with a large number of progenies derived from multiple crosses of wild cottons with the cultivated types like Madras Cambodia Uganda 1, Madras Cambodia Uganda 2, 44 3, H. 19 and 1908. They await further study.

14. *Fundamental studies (Cotton Breeding Station, Coimbatore).*—This item of work is pursued with the object of elucidating the genetic behaviour of various mutant characters in cotton. For a study of the inheritance of fibre fineness, backcross F-1's and F-2's of crosses involving a fine linted *arboreum* type No. 14 and other coarse types like *cernuum, sanguineum* and Podupathi have been arranged to be raised.

15. *Study of heterosis and vegetative propagation (Cotton Breeding Station, Coimbatore).*—The object of this item of work is to study the manifestation of heterosis in the first generation hybrids of different crosses and explore the possibility of harnessing the same in the subsequent years by propagation adopting vegetative methods. Stem cuttings of the hybrids between Cambodia 2 and S.I.V. 135 have been planted in the field after allowing to root in a rooting media made up of two parts of red earth and one of sand to be compared against seed-sown crop of the same hybrid to study how the crop raised from stem-cuttings compared with seed-sown crops.

16. *Cotton in rice fallows (Agricultural Research Stations, Aduthurai, Palur and Central Farm, Coimbatore).*—The object of this item of work is to evolve an early American variety of medium quality to be grown in the rice fallows in deltaic and non-deltaic areas of Madras State. Trials in the rice fallows with four varieties revealed coker, a long staple American variety to be better than the existing strain P. 216-F at Aduthurai and Madras Cambodia Uganda 2 to be better at Coimbatore. In a spacing trial conducted, close spacing of $1\frac{1}{2}'' \times 4\frac{1}{2}''$ was found to record higher yields than the wider

spacings at all the three centres, Aduthurai, Palur and Coimbatore and significantly so at the first centre.

17. Besides the above breeding projects, a scheme for the certification of superior cottons, viz., Madras Cambodia Uganda 1 and Madras Cambodia Uganda 2 which are exempt from price control, continued to function with the headquarters at Rajapalayam. It provides an organization for the inspection of the crops and produce of Uganda cottons and issue of certificates of purity which will help the cultivators and traders to obtain better prices for these superior cottons. This schem is financed by the Madras State.

The following seed multiplication and distribution schemes were functioning during the period :—

(*a*) The scheme for the multiplication and distribution of Madras Cambodia Uganda 1 and Karunganni 5 cottons at Tiruppur.

(*b*) The scheme for the multiplication and distribution of Karun ganni 2, Madras Cambodia Uganda 1 and Madras Cambodia Uganda 2 cotton seeds at Koilpatti

(*c*) The scheme for the distribution of Westerns 1 at Guntakal.

(*d*) The scheme for the multiplication and distribution of the seeds of Cocanadas 1 and 2 at Guntur.

In addition, seed nucleus plots for Cambodia 2, Madras Cambodia Uganda 1 and Karunganni 5 at Coimbatore, Karunganni 2, Madras Cambodia Uganda 1 and Madras Cambodia Uganda 2 at Koilpatti, Westerns 1 at Hagari, Northerns 14 at Nandyal and Cocanadas 1 at Guntur were maintained under a separate scheme financed by the State Government.

18. *Total quantity of seeds of improved strains distributed, area covered, additional production estimated, etc., during the period 1st July* 1953 *to* 30*th September* 1953 *in the Composite State of Madras are given below* :—

	Quantity distributed.		Area expected to be covered.	Additional production of lint estimated (bales of 392 lb. each).	Economic gain to the State.
	MAUNDS.	LB.	ACS.		RS. IN LAKHS.
1 Cambodia 2	373	82-2/7	1,535	117	0·64
2 Madras Cambodia Uganda 1 (Winter)	11,972	„	49,256	3,393	27·09
3 Madras Cambodia Uganda 1 (Summer)	37	„	152	10	0·08
4 Karunganni 5	2,474	„	16,965	1,515	6·78
5 Westerns	7,248	„	50,935	1,169	4·58
6 Cocanadas 1	4	„	27	1	..

No new strains were released during the year.

(*e*) *Sugarcane.*

The research items under investigation at Anakapalle and Gudiyattam were selection of varieties, trial under swamp conditions, manurial trials with continous application of ammonium sulphate, nitrogen nutrition of the cane and use of foliage nitrogen for diagnosis for nitrogen deficiences, methods and time of planting, lodging and its influence in juice quality, water requirements, composting cane trash, clarification of juice through lime, control of weeds, sugarcane pests and diseases. The trials were still in progress.

Sugarcane liaison farms.

The four liaison farms serving as regional testing and demonstration centres continued this useful work during the period under review.

At Samalkot, for the year 1953–54, an area of about 20 acres was taken on lease in S. Bhimavaram village for the liaison farm. The experimental work was continued as per the technical programme of work. Among the important operations during the period were manuring, earthing up of cane rows, deepening of channels and trash twist propping. In the yield trials with early maturing varieties, Co. 684 is seen to be making good progress followed by Co. 419; while not much of difference could be observed in the yield trials with the mid-season maturing varieties. The Rayungans showed more uniform and better growth. No visual treatmental differences could be made out with both Co. 419 and Co. 527 in the manurial observation plots.

At Kulittalai.—The entire cane area of nine acres was harvested for jaggery making, due to the sugar foctory at Pugalur being closed. For this newly planted cane area, the application of the second dose of concentrates and earthing up, followed the main operations. In the Rayungans trials, growth in the Rayungans was better. Closer spacing in setts has resulted in tillering being effected in the experiment.

In Hospet liaison farm weeding and irrigation were two of the main operations in the sugarcane crop. Puddling for planting the rotation crop of paddy was in progress during the period under report. In the mid-season varietal experiment Co. 650 exhibited good vigour.

Under swamp conditions Co. 449 has responded better than Co. 419. In the yield trial of early varieties Co. 630, Co. 419, and Co. 449 were seen to be better followed by Co. 620. In this manurial observation, application of 250 lb. nitrogen was seen to be better with Co. 449 while with Co. 419 the differences were not marked. In the time of planting experiment Co. 419 is seen to be better in growth than Co. 449 and Co. 527. In the ratoon observation plots, no differences in growth could be made out between these treatments. The second half dose of concentrate was applied to this experiment and earthed up. Adsali crop was planted during the period.

At Nellikuppam liaison farm, earthing up, trashing of old leaves, irrigation, application of the second half-dose of concentrates, incorporation of green leaves and hoeing were in progress. In the monthly planting experiment Co. 419 and Co. 527 recorded almost similar analysis. In the Rayungan trial the population in both the treatments was similar, while the stand was better with Rayungans. In the periodical planting trial the C.C.S. was noted to be low and the 9 months old crop proved to be too immature. In the varietal trials Co. 650, Co. 527, Co. 419 and Co. 621 in the early, Co. 650, Co. 419 and Co. 449 in the mid and Co. 473 and Co. 419 in the late were noted to be good.

(*f*) *Horticulture.*

Research.

Fruits—Mango.—Nashpati among varieties introduced from Northern India, Muvandan among the polyembryonic ones and Chemutan among those from Ceylon yielded fair sized crops of 297,420 and 170 fruits per plant respectively. An analysis of yields recorded during the season indicated that Bangalora among the commercial varieties and Himayuddin among superior table varieties gave maximum individual tree yields of 1,951 and 307 fruits respectively. One more hybrid, Neelum X, Chinna Suarnarekha came

to bearing newly during the year but the fruit was small weighing only 3½ oz. and was only of medium eating quality. Analysis of yield data once again proved that the method of propagation has little or no influence on the ultimate growth of yield of the scion varieties.

Citrus.—Under the hybridization scheme, F-1 progenies of four parental combinations in each of sweet orange and lemon were successfully raised. In the rootstock trials for mandarin orange at Kallar and Wynaad, Jamberi accounted for the maximum tree growth. At Wynaad mandarin trees which were manured and mulched, put on new growth and were able to withstand drought better than others.

Bananas.—Inter-varietal crosses at Kallar and Coimbatore failed to produce seeds. Further work was restricted to crossing with wild species of banana. As a result, ten hybrid progenies in four different combinations were secured and planted at Kallar.

Apple.—Two mixed American apple varieties stood out during the year as of promise. Among the five rootstocks under trial for Rome Beauty, Merton 779 and 778 accounted for greater tree vigour while grafts on crab stock were leading in respect of tree yield.

Plum.—In the rootstock trial with seedling stocks of plums and the common peach for the two scion varieties, Czar and Gaviota, increasing stock scion incompatibility in all the combinations was perceptible. Top working choice but shy bearing varieties, viz., Shiro and Abundance with suitable Pollinisers, Hale and Kotagiri respectively recorded in their sixth year of bearing yields representing 99·8 and 118·5 per cent increase over these trees which were situated away from the pollenisers.

Jack.—In the rootstock trial at Kallar the grafts on Rudrakshi continued to be the most vigorous.

Annonaceous fruits.—In the rootstock trial with four rootstocks for the custard apple, bull's heart was adjudged to be relatively the best on considerations of tree vigour, yield and stionic compatibility while Soursop and *A. Palustris* stocks proved unsuitable.

Sapota.—Fifteen hybrid seedlings resulted from crosses between Cricket Ball and Oval varieties at Coimbatore. In a rootstock trial for sapota at Taliparamba, trees on *Mimusops hexandra* accounted for maximum growth whereas grafts on *Madhuca latifolia* exhibited early signs of incompatibility.

Guava.—The results of pruning trials in this fruit at Kodur showed that in Red-fleshed variety pruning invigorated growth and induced higher blossom production, while in the variety, Lucknow 49, pruning depressed fruit yields. Hybridization work involving ten combinations resulted in the production of crossed fruits in seven parental combinations which were developing.

Papaya.—In breeding for purification of selected lines through sib-mating was continued at the college orchards. The named type, Ranchi, attained purity in the year and efforts were put underway for large-scale multiplication of its seeds.

Research work in fruits has been in progress at Kodur for over 17 years and at Coonoor, Kallar, Burliar and Coimbatore College

orchards was intensified during the past 7–9 years. Promising varieties of fruit plants have been made available to orchardists.

Supply of plants.—During the period ending 30th September 1953, as many as 53;980 fruits and other plants were made available to indentors. It is estimated that these are expected to bring at least about 300 acres under improved plant material, which can form secondary centres for further dissemination.

7. Systematic Botany.

I. *Madras Herbarium.*—A total number of 224specimens were identified which included the 104 numbers to correspondents, the rest being specimens identified for the Herbarium from the collections made during the surveys in Ramanathapuram district. The total number of incorporation during the period was 180 specimens. On exchange basis 100 specimens were received from Australia.

II. *Survey of district floras and compilation—Flora of Ramanathapuram district.*—The compilation was in progress from Herbarium material.

Flora of Tirunelveli district.—Compilation of the flora from Herbarium material was concluded and final typing was in progress.

Flora of Coimbatore District.—A beginning was made in compilation of the flora from Herbarium material. Collections were however made during the brief tours in Satyamangalam and Bhavanisagar. The survey work was in progress since 1951 onwards. When completed the surveys will form a valuable guide to the flora of the districts.

III. *Economic Botany and Acclimatisation trials.*—The work was in progress since 1946 to explore the possibilities of new species of grasses, legumes forage and green manure plants.

(i) *Fodder grasses.*—The 2 species of grasses, viz.. *Urochloa mosembiensis* and *Digitaria* sp. performed well and the area under these were increased. Besides being drought resistant, both the species showed good soil binding capacities. *Cenchrus* sp. (Bloubuffel) continued to perform well and *Bothriochola insculpta*, a new introduction from Delhi, gave satisfactory preliminary results.

(ii) *Fodder legumes and Forage plants.*—Among the legumes *Rhynchosia minima*, *Alysicarpus rugosus*, *A. Longifolius* and *Desmodium tortuosum* were found to do well under dry conditions. *Phaseolus semierectus* was a success under Coimbatore condition.

Atriplex vesicaria.—(Salt Bush) which is known to be a fodder plant in Australia was a splendid performance under the Coimbatore conditions.

(iii) *Green manure and cover crops.*—Cassia hirsuta consistently showed growth under wet-land and rainfed conditions standing lopping well. *Indigofera glandulosa* from Nandyal gave successful results. All available species of *Cortalaria* were sown for determining their suitability to different tracts.

Glycine javanica was one of the best performers under rainfed conditions and *Centrosema pubescens* continued to maintain good growth with rare capacities to spread rapidly.

IV. *Medicinal plants.*—The collection of medicinal plants is being maintained. Small quantities of seeds were sent to several correspondents.

V. *Essential oil yielding plants.*—The analysis of periodical harvests of manurial trials of Vettiver was continued. The analysis showed that the quantity of oil obtained from roots harvested after 13 months was more than that of 12th months' harvest. As between Wynaad and Pattambi products, the quality of Wynaad harvests excelled those of Pattambi. Work was in progress since 1951.

VI, *Seed supply.*—The following quantities of seeds of grasses legumes, etc., were supplied to departmental officers and private parties during the period :—

Panicum antidotale	85½ lb.
Cenchrus ciliaris	31 ,,
Cenchrus setigerus	1¼ ,,
Cenchrus echinoides	¼ ,,
Blou Buffel	4 oz.
Iselima laxum	2 lb. 9 oz.
Thin Napier	2 lb. 10 oz.
Heteropogon contortus	2 lb.
Centrosema pubescens	35 lb. 6 oz.
Pueraria phaseoloides	19 lb. 15 oz.
Indigofera endacaphylla	1 lb. 10 oz.

8. Government Botanical Gardens and Parks.

Government Botanic Gardens, Ootacamund.—Introduction and the study of new kinds and varieties of ornamental and economic plants were continued. Pears, Surinam cherry and Red Muscadine grapes were introduced during the period.

Floricultural records on annuals, trees and shrubs were continued to be collected as these would be useful in the designing of various garden layouts suggestions on suitable plant materials for various locations besides giving the basic data. Seed viability studies carried out on three important kinds of trees of Ootacamund, viz. *Eucalyptus globules*, *Cupressus macrocarpa* and *Cupressus torulosa* were continued.

Sim's Park, Coonoor.—Floricultural study on the various annuals, shrubs and trees in the park gave basic information on their vegetative and floral characteristics which is quite useful in the designining of mixed borders and shrubberies in garden layout according to location and plant meterials available.

Studies on the taxonomy of the various roses and Eucalyptus species were continued during the period to evolve a key for their idenification. Descriptions were recorded for four varieties of roses and five species of Eucalyptus.

Seed viability studies were continued on seeds of three important tree kinds, viz., *Eucalyptus ficifolia*, *Eucalyptus citriodora* and *Jacaranda mimosaefolia*.

Botanic Gardens, Bapatla.—A large number of trees, shrubs and herbs obtained for the Botanic Gardens, Ootacamund and Coimbatore the Pomological Station, Coonoor, etc., were planted. Twelve species of ornamental and flowering plants were planted in nurseries for multiplication and ten species of ornamental plants were supplied to correspondents.

9. Plant Physiology.

Research.

Presoaking studies.—Studies were continued in a research scheme aided by the Indian Council of Agricultural Research to investigate the possibilities of presoaking seeds in nutrient salt solutions as a method of increasing the crop yields. The optimum period of soaking was determined by tests to be 12 to 16 hours in nutrient salt solution. It was found in the case of tomatoes that presoaking the seeds in phosphate solution of suitable type and concentration could compensate to a large extent the disadvantage when plants were grown in a phosphate deficient medium. The work was in progress since 1952 and has to be continued for confirmation of results.

Chemical and analytical.—Methods for the determination of iron and copper were tested out and the most suitable methods standardized. Work was in progress since 1952 and has to be continued.

Weed control by chemical herbicides.—Studies were carried out under a scheme financed partly by the Indian Council of Agricultural Research to devise suitable methods of eradicating or controlling some of the most troublesome and persistent weeds in South India. The main weeds studies were *Cyperus rotundus Cynadon dactylon, Trianthema portulacastrum and Acanthospermum* hispidum at Coimbatore. A number of weedicide chemicals were tried in different dosages including various formulations of 2, 4-D, M.C.P.A. 2, 4, 5-T, I.P.P.C. and P.C.P., diesel oil and nutmeg leaf oil both singly and in Coimbatore. Work was in progress since 1952 and tests are still in experimental stage.

Studies on seed viability and germination.—Studies were continued to test in more detail the utility of 2, 3-5 triphenyl tetrazolium chloride in assessing seed viability.

Methods of overcoming dormancy in green manure seeds were tested. It was found that for green manure seeds different methods are required for different varieties and specific tests are therefore needed to devise suitable methods for each case. Work was in progress since 1953. The use of Tetrozolium chloride for rapid assessment of viability of seeds is already recommended for adoption by the Seed Development Staff.

10. Cyto-genetics.

The research work of the section helps the Plant Breeding sections in their work of evolution of superior strains. The following results were obtained :—

1. Paddy seeds of *O. breviligulata* and *O. brachyantha* and *O. glaberrima* varieties, from French Sudan, were received and plants grown. Crossed spikelets of *O. sativa* with *O. australiensis* and *O. Latifolia* were sown.

The progeny of the amphidiploid was studied.

The cytological examination of the *F. hybrid of S. halepense* × Co. 1 sorghum was done.

Fifteen varieties of *S. italica* received from Japan were sown. *O. Brachyantha* and *O. breviligulata* were found to be diploids, with 2n=24 chromosomes and fertile.

The amphidiploid formed only bivalents during meiosis and its behaviour is like that of a diploid. The progeny (2n=42) showed Mendelian segregations.

Economic work.—Slips of the F1., hybrid of cumbu and Napier grass and also one of the amphidiploid, one hundred in each were supplied for trial as fodder to a ryot in Kollegal.

The cumbu × Napier hybrid has given good yields of fodder in Mangalore and in the sewage Farm of the Coimbatore Municipality.

11. Agronomy.

Research in Agronomy under the Agronomist and Professor of Agronomy, Coimbatore was initiated during the year. Facilities were provided for research work on the Central Farm as for other Specialists. Three Agronomic experiments were laid out.

12. Agricultural Engineering (Research).

1. *Mechanisation of paddy cultivation.*—A pedal operated paddy thresher on the model of a sample Japanese machine received, but employing a threshing drum twice the length and with greater diameter was manufactured. Trials were conducted at the Central Farm, at the Paddy Breeding Station and Agricultural Research Station, Aduthurai and in a ryot's holdings at Pappanad. An output of 22 bags in a day of 8 hours was obtained. The threshing was so complete that further cattle threshing was not required.

A Clifford Rotary Hoe powered by 3 H.P. petrol engine was tested for puddling both at the Paddy Breeding Station and Agricultural Research Station, Kankanadi and it was found that this machine was unsuitable for wet cultivation.

2. Experiments with Massey Harris self Propolled Harvester Combine.

Field scale trials were conducted at Vettakaranpudur with this machine for harvesting irrigated cholam and irrigated ragi, cumbu, samai and paddy. It was found that excepting in the case of samai, the machine could be used only as a stationary thresher and when used thus it was not economical.

3. *Miscellaneous—Case Mower.*—A six-feet case tractor drawn mower was tested for harvesting cholam, cumbu and samai. It works very satisfactorily in cumbu and samai whereas with cholam the implement was found to handle the thick straw only with difficulty and the cutting edge needed frequent resharpening.

13. Agro-Industries.

1. *Bee-keeping.*—A scheme for intensive propaganda on bee-keeping was in operation in the districts of Srikakulam, Visakhapatnam, East Godawari, West Godawari, Krishna, Guntur and Chittoor. About 200 new colonies were hived and 2,437 hives were attended for wax moth control and honey extraction. In the southern districts there was no such scheme and the plant protection staff attended to bee-keeping also. They helped in hiving 12 new colonies and inspected 40 colonies during the period under report.

2. *Malt manufacture.*—The factory was closed on 31st January 1953 and the plant and machinery are under disposal.

3. *Ergot production.*—The cultivation of rye for ergot production was largely confined to the ergot farm (35·5 acres) and the Agricultural Research Station, Nanjanad (20 acres) and 40·5 acres under private growers.

Twenty pounds of ergot from the Agricultural Research Station, Nanjanad and 30 pounds ergot were collected till the end of 30th September 1953.

4. *Fruit preservation—Fruit juices, squashes, cordials and syrups.*—At Kodur, mixed or composite fruit squashes of the following ten different

combinations were made in order to develop new products, combining quality with economy :—

(i)	Musk melon	Orange.
(ii)	Do.	Jaman.
(iii)	Do.	Watermelon.
(iv)	Do.	Cashewapple.
(v)	Do.	Pineapple.
(vi)	Do.	Passion fruit.
(vii)	Jaman	Ginger.
(viii)	Do.	Orange.
(ix)	Do.	Cashewapple.
(x)	Cashew-apple	Pineapple.

Products numbered (i), (v), (vi), (vii), (ix) and (x) proved very promising.

Jams, jellies and marmalades.—A mixed jelly from wild figs and *Carissa carandas*, was attempted with success.

14. Agricultural Research Stations.

The Agricultural Research Station, Aduthurai.

1. *Crops—Paddy*—(i) *Seed multiplication.*—The total quantity of paddy seed produced during the period under report was 6,743½ lb. and the quantity of nucleus seed of the different strains distributed was 5,117 lb.

(ii) *Breeding*—(*a*) *Introduction.*—The ten Chinese varieties received from the Director, Central Rice Research Institute, Cuttack during the previous season were under comparative yield trial during the year with ADT. 3, ADT. 4, ADT. 9 and ADT. 20 as standards. All the ten Chinese varieties resisted lodging to a certain extent but in the ripening stage they also lodged due to heavy rains. There was also incidence of 'stem rot' disease and so the results were vitiated.

(*b*) *Pure line selection.*—A total of 59 cultures in Mattaikuruvai, a red riced short duration variety cultivated in the coastal taluks of Tanjore and South Arcot districts were under comparative yield trial and 47 promising high yielding cultures were carried forward. Eleven cultures of Tiruthurai-poondi kar, a flood resistant variety of short duration were under replicated yield trial and all the cultures were carried forward for repeating the trial since no conclusive results could be had due to incidence of Jassids and 'stem rot'.

(*c*) *Hybridization.*—Progenies of crosses in different generations intended for the evolution of (*a*) dormont short duration strains for the Kuruvai season, (*b*) non-lodging strains with stiff straw, (*c*) saline resistant strains suitable for the Kuruvai season and (*d*) fine grained Konakuruvai strain which do not shatter easily were studied and promising materials were carried forward for further trial.

(iii) *Manurial experiments.*—Three manurial experiments, namely, (i) organic matter requirement of the soil, (ii) nutrient requirement of paddy and (iii) permanent manurial experiment were conducted during the Kuruvai season. In none of the experiments reliable data could be had since there was severe incidence of Fulgorids and Jassids and also 'Stem rot' disease with the result the crop in the experimental plots became uneven and gave very poor yields.

(iv) *Cultural experiments.*—As in the previous case, no results could be had from the two cultural experiments, namely, "Different proportions of Kuruvai, Ottadan mixture for 'UDU' cultivation" and Japanese method versus Farm Method of cultivation, due to severe damage by insect pests and fungus disease.

Other crops—(i) *Fruits and vegetables.*—The vegetable area in 'K' block to an extent of 1·4 acres was grown with bitter gourd, snake gourd, bendai, tomato and other vegetables for the production of seeds and seedlings. In addition, a fairly large number of fruit plants comprising of mango grafts, seedlings of acid lime, rooted cuttings of Malta lemon and jack seedlings were produced for distribution. The quantity of seeds and number of seedlings and fruit plants distributed during the period ending 30th September 1953 are furnished below :—

Vegetable seeds	64 lb. ¼ oz.
Vegetable seedlings	104,780 Nos.
Fruit plants	270 Nos.

(ii) *Green manure crops.*—Intensive work on green manure crops, such as *Gliricidia maculata, Sesbania Speciosa, Indigofera tyesmanii* was under progress at the Research Station. The following are the quantities of green manure produced and utilized for manuring and the quantity of seeds, cuttings and seedlings distributed during the period ending 30th September 1953.

	Quantity of green matter produced.	Quantity of seed supplied.	Number of seedlings supplied.
	LB.	LB.	
Sesbania	252,000	13	58,500
Gliricidia	720	..	3,837

(iii) *Fodder crops.*—The quantity of green grass cut and fed to the milch cows and the number of slips of Napier, guinea and buffalo grasses sold during the period under report are given below :—

	LB.
Green grass cut and fed to cattle	15,488
Slips of Napier grass sold	275
	NOS.
Slips of guinea grass sold	2,100
Slips of buffalo grass sold	255

(iv) *Coconuts.*—A total number of 258 coconuts were obtained and sold during the period under report :—

New sources of lift irrigation.—One filter point tube well in 'E' block was sunk during the period under report bringing the total number of tube wells in the farm to six.

Agricultural Research Station, Ambasamudram.

I. *Research—Paddy.*—Six hundred and eighty-three experimental units were planted during the period and these comprised the single plant selections of the local varieties (viz.,) Maikuruvai, Seenganni and Bankee, the extracts of the hybrid progenies of ASD 1 × Veedhividangan and ASD × other local varieties (Multiple crosses) besides agronomic investigations, viz., the effect of summer ploughing in Tambraparani soils and the relative merits of the Japanese versus farm method.

None of the above items except the trial on the Japanese versus farm method came up for harvest within the period of the report. Even though the possibilities of increasing the production of paddy have been definitely indicated in the Japanese method of cultivation, the cost

at which such an increase was effected, was found to be rather very prohibitive.

Miscellaneous.—The vast potentiality of augmenting the production of green manure by raising a marginal crop of Sesbania to solve the manurial problem of the second crop (Pishanam) was amply demonstrated at the station in the period though the production data is available only for the second part of the report.

Seed multiplication.—A total area of 9·41 acres was put under improved strains of paddy for seed multiplication and a total quantity of 5,913 lb. of seeds was secured during the period under report.

Seed distribution.—(1st July 1953 to 30th September 1953.) The quantity distributed was as follows:—

	LB.
Paddy seed	818½
Groundnut pods	242
	NOS.
Guinea grass slips	1,000
Water grass slips	300

The Sugarcane Research Station, Anakapalle (Visakhapatnam district).

Sugarcane.—The items under investigations in respect of sugarcane, continued to be as in the previous years. The main lines of work concerning the selection of the varieties superior to the present standards, and of varieties for planting under swamp conditions were under study. Under the important aspect of manuring, the effect of continuous application of ammonium sulphate on the soil and its comparative merit as a source of nitrogen with farmyard manure, the nitrogen nutrition of the cane crop, the use of its folier nitrogen as diagnosis for the nitrogenous manuring, and the use of groundnut cake and ammonium sulphate as manure at the same level of nitrogen formed the various investigations. The cultural aspects concerning the methods of planting cane, the types of seed material and lodging with its influence on juice quality were under study. The physiological relationship of the two types of soil, clayey and loamy, towards the water requirement of sugarcane and the methods of hastening the decomposition of cane trash in compost making were under experimentation. Lime as a clarificant in the preparation of jaggery was under examination with the PH as the index while the influence of the different weedicides in controlling weeds in cane field were under trial. The chemical control of insect borers and Pyrilla on the cane crop and the studies on smut formed the pathological side of research.

In respect of crops other than sugarcane, paddy, millets, green manures and fruits and vegetables occupied a prominent place. Paddy was planted over 29·65 acres. The mean acre yield from the non-experimental area worked out to be 2,565 lb. per acre, as against 1,420 lb. obtained during the year and a twelve-year average of 2,134 lb. per acre on this station. Co. 25 was found suitable for late planting that is common in the Visakhapatnam and Srikakulam districts.

Ragi and *ganti* occupied an area of 2·34 and 3·12 acres respectively. While ragi yielded about 1,500 lb. per acre *ganti* recorded 522 lb. Spacings of six inches and eight inches gave more tillers than the four inches.

Among the green manures, sunnhemp gave an average of 3,890 lb. of green matter per acre over 17–18 acres. Sesbania in an area of 3·50 acres in the wet land gave an acre yield of 5,885 lb. Cowpea raised over 0·65 acre yielded 11,585 lb. of green matter. At the rate of about 32·6 lb. of green stuff per shrub over 67,000 lb. of green stuff was obtained from gliricidia. A quantity of 1,042 lb. of sesbania seed was collected from the plants grown on the field bunds.

The following fruit and economic plants were distributed during the period under report besides 116 lb. of vegetable seeds:—

1. Mango grafts	570
2. Sapota grafts	512
3. Guava layers	30
4. Lemon layers	548
5. Citrus layers	32
6. Other fruit plants	364
7. Economic plants	342

Besides the above a white-leg horn poultry unit of 88 birds was maintained. During the three months under review 322 eggs were received of which 175 were hatched.

On 15th July 1953, a training course for the demonstration maistris was started with 40 candidates under the second-year programme of the Five-Year Plan—G.O. Ms. No. 1877, Food and Agriculture, dated 4th December 1952. This course continued beyond this period under this report.

The Agricultural College Farm, Bapatla (Guntur district).

Paddy.—The study of the performance of the promising cultures of paddy was continued. Of the 10 strains AKP. 2 continued to be the best with an average of 11·9 tillers followed by SLO. 18 with an average of 11·2 tillers per plant. In an observational trial of alkaline resistant cultures and strains, culture No. 10034 recorded the maximum number of 12·6 tillers per plant.

In a manurial experiment on paddy with different levels of super phosphate and ammonium sulphate and their combinations 45 N. and 30 P. recorded the maximum average. tiller production of 11·9 tillers per plant followed by 30 N. and 60 P. with 11·5 tillers per clump respectively.

Sugarcane.—In the study of the sugarcane varieties under plant and ratoon crops, Co. 527 was the best in tiller production with an average number of 6 and 10 tillers per clump respectively.

Banana.—Among the 20 fruit varieties, Karpura Chakkrakeli recorded the maximum average bunch weight of 13 lb. per bunch while Batheesa recorded the maximum average bunch weight of 20 lb. among the curry varieties in the newly reclaimed saline soils.

Ragi.—(1) Three strains were under yield trial along with the local variety. The crop was grown entirely under rainfed conditions. Of these AKP 6 recorded the maximum number of three tillers per plant while AKP 2 recorded the lowest number of two tillers per plant.

(2) In the experiment of organic manure as soil amendment on rainfed ragi, plots receiving 7,500 lb. of green leaf indicated 50 per cent increased tillering in contrast to no manure plots.

Pulses—Redgram.—Seven cultures of redgram were sown in observation plots along with local variety for the study of their suitability to this tract.

Cotton.—Cotton sown after first crop paddy in paddy lands recorded very poor yield due to the high temperature that prevailed during the hot weather period.

Green manures.—Ninety-six thousand and two hundred sesbania seedlings and 5,000 Ipomea cuttings were planted on field bunds and other vacant spaces. The first cutting of green leaf from two-year old Glyricidia plants planted along the border of the sides of southern block, recorded 30 lb. of green leaf per plant. Ipomea cornea planted along bunds were found to come up well even in slightly saline soils and could withstand drought. One year old plants recorded 80 lb. of green matter per plant. This will be a better substitute for glyricidia grown for green leaf production.

Fodder crops.—Cowpea grown for fodder in sandy soils under rain fed conditions recorded 14,268 lb. of green fodder per acre. The first cutting of Napier X cumbu grass and Guinea grass recorded 18,000 lb. and 10,850 lb. of green fodder per acre respectively.

Alkathene film lined gunnies versus ordinary gunnies.—Trials have indicated that super phosphate can be stored without detriment to the containers for a period of over one year when stored in alkathene film lined gunnies, while the ordinary gunnies gave way in 2 to 3 months due to the acid action. The results of this trial will solve the practical difficulty experinced by many a cultivators in storing superphosphate.

College dairy.—Different breeds of cattle, Ongole, Scindhi, Gir, and Murrah are maintained at the College Dairy for students' training and for the improvement of local breed.

Ten thousand eight hundred and eighteen lb. of dairy products were received. Twenty-four services by the Ongole, Murrah and Scindhi breeding bulls on local animals and dairy animals were recorded.

Poultry.—A small unit comprising of white-leg horn, Road-Island-Red and Black-minorcas were maintained for imparting training to the third-year students of Agriculture.

Four birds, one hundred and ninety eggs for hatching purposes and one hundred and sixty-three eggs for table purposes were sold to the public during the period under report.

Vanamahotsava.—The fourth Vanamahotsava celebration was inaugurated by the Principal, Agricultural College, Bapatla, in July 1953 and 420 timber plants and fruit plants were planted. A number of fruit plants were supplied to the public. Three and three-fourths pounds of prosophis Juliflora was sown over a length of four furlongs for live fence.

Rice Sub-station, Buchireddipalem (Nellore district).

Paddy—Pure line selections.—Thirteen cultures were under comparative yield trials. Strains of B.C.P. 1, B.C.P. 2, B.C.P. 3, B.C.P. 4, B.C.P. 5, and the promising culture M. 4—2 were planted for multiplication of seed.

Hybridization.—Thirty-two promising and high-yielding cultures were selected and they were sown in the last week of July and planted under primary yield trials in the first week of September.

Introduction of the strains from the other stations.—Co. 25 and Co. 26 were planted along with B.C.P. 1 and B.C.P. 2 for comparison in first week of September.

Blast study.—Experiments to study the incidence of blast on (1) Blast resistant strains when manured with graded doses of ammonium sulphate, (2) under manured conditions with lime, super and heavy dose of green leaf, and under different methods of planting (on paddy planted with seedlings raised under semi-dry and wet conditions) and under different irrigational treatments were planted in the second week of September.

Cultural and manurial.—An experiment to study the errative merits of dry ploughing and planting expeditiously on receipt of water versus growing green manure crop puddling and planting and a trial with phosphatic manures, bonemeal and super phosphate on paddy, were conducted in the third week of September.

Other crops.—Cotton in rice fallows and green manures were grown.

Seed distribution.—The following seeds and plants were supplied :—

Paddy seed, 571 lb.

Oil seed—T.M.V. 2 pods, 1,860 lb.

Green manure plants.—

Sesbania, 316,350 seedlings.

Glyricidia, 330 seedlings.

Kapok, 200 seedlings.

Pungam, 123 seedlings.

Vegetable seeds, 1,016–6½ ounces.

THE CENTRAL FARM, COIMBATORE.

Central farm.—The area under cultivation during the period was 193·91 acres.

The 'placement of fertilizer experiment' on paddy whose object was to find out the effect of ammonium sulphate and super phosphate applied at different depths on the yield of paddy was laid out in Central farm wet lands with three treatments and six replications.

36·65 acres including 2·00 acres of Japanese method were grown with paddy in wet lands.

Sesbania was planted along the bunds of all the fields at the time of transplanting of paddy. The paddy crop received green manure at the rate of 5,000 lb. of green stuff per acre about 10 days prior to planting.

Various strains of ragi were grown in a total area of 21·63 acres. A total area of 32·45 acres was put under MCU. 1 cotton variety for seed multiplication.

A large number of tree seedlings are distributed to ryots and institutions. Besides seedlings were planted in all available spaces in the College Estate. Nurseries of economic and leaf yielding trees were also raised.

College dairy.—The strength of the Dairy herd at the commencement of the year was 46. Five calves were born to them. Three buffalo heifers and two buffalo bull calves from Taliparamba and one Scindhi stud bull from Livestock Research Station, Hosur, were received by transfer. One old Murrah Buffalo with calf and old cow and one bull calf were auctioned as they were uneconomical. One Murrah buffalo calf and one scindhi bull calf died. Two Murrah buffalo bull calves were transferred to the Central Farm and one Scindhi bull calf to the Distrist Livestock Farm, Malabar. Thus the closing balance on 30th September 1953 was 48. The number of goats which was six at the beginning of the year was reduced to four due to sale of 2 goatlings. The stud Murrah buffalo No. 20 served ten outside buffaloes and stud goat No. 2 served six outside she-goats.

The Poultry section possessed a total of 225 birds to start with and 71 were added by hatching. Seventy-nine birds were sold to the public and six were auctioned and 58 died. The closing balance on 30th September 1953 was 153.

The Agricultural Research Station, Guntur.

Cropping improvement.—The work on Cotton, Groundnut, Chillies and miscellaneous crops was continued and the details are given cropwar.

Cotton—(1) *Maintenance and seed multiplication of C*1, 2, *Cotton.*—An area of 4 acres was raised with selfed seed of Cocanadas-2 cotton for the production of nucleus seed for seed-farm needs in Guntur district. The germination was satisfactory.

(2) *Trial of early cottons.*—A varietal trial of cotton was raised with five varieties, viz. (1) Lakshmi (2) 34/4, (3) C, 520/2 (4) 197–3 and (5) Anakapalle white to find out suitable white cotton that suits Coconadas tract. Germination was found to be uniform.

(3) *Trial of early cottons in Chilli-Cotton mixed trials.*—In order to isolate a suitable early cotton that synchronises its harvest with Chilli, 5 Cotton varieties namely (1) Lakshmi, (2) 34/4, (3) C. 520/2, (4) 197–3, and (5) C. 2 were proposed to be sown simultaneously with Chilli transplantation and (2) a few weeks prior to chilli transplantation, in separate experiments. Cotton varieties were sown on 22nd and 6th September respectively and Chilli transplanting was done on 22nd and 23rd September. The germination of cotton and establishment of chillies were satisfactory.

(4) *Trial of dibbling H·420 cotton in standing groundnut.*—This trial was taken up with the following five treatments :—

(1) Pure groundnut sown in June-July.

(2) Groundnut sown in June-July and H·420 cotton dibbled on the same day.

(3) Groundnut sown in June-July and H·420 cotton dibbled 15 days latter.

(4) Groundnut sown in June-July and H·420 cotton dibbled 1 month latter.

(5) Pure cotton sown one month later than groundnut sowing.

(5) *Coriander.*—The seed material was kept ready for sowing as per the sowing programme approved by the Cotton Specialist, Coimbatore.

(6) *Groundnut.*—The trial was laid with seven promising bunch groundnut varieties, viz., A.H. 4218, A.H. 4111, 4515, 6481, T.M.V.2, A.H. 6279 and 6179 and the harvests were awaited.

(7) *Maintenance and seed multiplication of jonna and korra.*—An acre in each of G-3 Jonna and G-4 Jonna and ½ acre in G-1 Korra were raised for seed multiplication.

(8. *Chillies.*—Scheme for the improvement of chillies :—

A. Breeding.—The following cultures were transplanted after raising nursery, during the month of September.

(1) In family block and corresponding small bulk tests :—
23. Families comprising 10 old families and 13 new families in 2 series.

(2) Relicated row yield trials :—
279 cultures in 5 series.

(3) Hybrid populations of F-2., F-3. and F-4. comprising of 148 progenies.

(4) F-1. Material—45 hybrids.

(5) Two hundred and nine extra-State, intra-State and extra-Indian types.

B. Agronomy.—The following agronomical experiments were also laid :—

(1) Optimum spacing-*cum*-number of seedlings per hill experiment.

(2) Age of seedlings-*cum*-spacing experiment.

(3) Inter-culture experiment.

(4) Insecticidal experiment to know the effective insecticide for controlling thrips.

The quantities of improved seeds distributed and the probable area covered is given below :—

Name of improved seed.	Quantity supplied.	Probable area covered.
	LB.	ACS.
1 G-4 Jonna	5	0·5
2 Pusa gogu	10	1·0
3 C-1 Cotton	563	56·0
4 Coconadas-2 Cotton	181	18·0
5 A.H. 25	17	1·7
6 Coriander—G-14. bulk	36	3·0
7 Snakegourd	1 lb. and 10 oz.	0·5

The Sugarcane Research Station, Gudiyattam.

Varietal Study plots.—Fifty-nine varieties were planted and were under study. Thirty-nine new cane varieties received from Cane Breeding Institute, Coimbatore, were also planted for multiplication.

Main yield trial and early varieties.—Three early varieties, namely, Co.620, Co.630 and Co.659 were planted along with the Standard variety Co.419 and Co.449 in randomized replicated plots. This is the first year of trial.

Preliminary yield trial of early varieties.—Seven varieties, Co.691, Co.703, Co.705, Co.709, Co.727, Co.740 and Co.747 were planted in the experiments with Co.419, Co.449 and Co.527 as control.

Time of planting and harvesting experiment.—The crop planted in May 1952 and September 1952 were harvested during this period in the experiments. These experiments were started in 1951–52 and this is the second year of trial. The May and September crops yielded less than the January planted crops both in respect of yield and quality.

Trial of Rayungans.—This experiment was planted with the two varieties Co.419 and Co.449 to find out the suitability of Rayungans as seed material in comparison to the normal planting of setts.

Chilean Nitrate Trial.—This experiment was planted with Co·419 to study the efficiency of Chilean Nitrate as a Nitrogenous manure as against the normal mixture of groundnut cake and amonium sulphate. The harvest will be done in February 1954.

Pit planting trial.—This experiment was planted to compare the normal method of planting sugar cane in trenches as against the method of planting in pits as practised in portions of Madurai district. The canes will be harvested only in February 1954.

Paddy.—Only an area of 0·66 acre could be planted during this period due to adverse seasonal conditions and lack of water-supply in the wells. The varieties planted were G.E.B. 24 and M.T.U. 19. The yield of paddy was 3,036 lb. and 2,375 lb. respectively.

Groundnut.—TMV 3. was raised in an area of 0·80 acre. The crop yielded only 1,600 lb. of pods per acre.

Miscellaneous.—Seedlings of Pungam, Glyricidia maculata and Sesbania Speciosa were raised and distributed to the public and other institutions during the tree-planting week.

The Agricultural Research Station, Hagari (Bellary district).

In rotation experiments, Bengalgram was not sown since it was not included in the programme of the 4 manurial experiments; manuring cotton with superphosphate was discontinued since it was not helpful in hastening the maturity.

Crop improvements.—Under Setaria 9 cultures were under yield trials and 18 under preliminary yield trials. Culture under rust resistant studies were also sown.

In Sorghum.—Out of the 36 cultures, 12 were to be carried and the rest are retained for further studies.

Ragi.—Strains E.C. 4573 and E.C. 4310 were under observation.

Safflower.—Cultures received will be studied.

Onion.—The area under the seed crop is raised to 0·75 acres.

The following seed materials were transferred to the district work officers.

Particulars.	*Quantity.*
H. 1. jonna	16,654 lb.
M. 47-3 jonna	89 ,,
H. 1. ragi	1,151 ,,
Co. 1. ragi	303 ,,
Onions seed	307 ,,
H. 1. cotton seed	4,220 ,,
Prosopis pods	50 ,,
Prosopis seed	2,926 ,,
Guinea grass, slips	1,000 Nos.
Napier grass slips	500 ,,
Hedge plants	3 bags.
Vegetable seeds	18 lb.

Fruit Research Station, Koduru (Cuddapah district).

Mango.—Nine F. 1. seedlings in new parental combinations were planted for future study. 'Shaded' fruits of two varieties generally proved superior in quality and size to 'Exposed' ones, indicating the possible influence of position of the fruit-bearing branch on fruit quality in mango.

Citrus.—All citrus varieties bore exceptionally heavy crops during the season. Fifteen varieties of sweet orange, yielding seedless or few seeded fruits, were isolated as promising. Among others, one variety of tangelo and another of lemon (Seville) were adjudged as promising.

Miscellaneous fruits—Ficus Roxburghii.—Gave big-sized figs of fairly good eating quality.

3. *Number of private orchards visited.*—Twenty private orchards were visited for locating outstanding trees of merit and for rendering technical advice on fruit culture.

4. *Number of enquiries received.*—Over 80 enquiries for the supply of plants and for the advice on fruit culture were attended to during the period.

5. *Production and sale of plants.*—

Variety.	*Number of plants distributed.*
Mango	1,733
Citrus	2,249
Others	424

The Agricultural Research Station, Koilpatti (Tirunelveli district).

1. *Cotton breeding.*—The distribution of the strain cotton K.2 was further extended during the year with the help of the special K.2 and Co. 4. scheme staff. The four economic cultures evolved by the Assistant Cotton Specialist, Karunganni Scheme, Koilpatti, having a staple length of nearly 1 inch were tested in the district trials. The results of the trial are awaited.

2. *Millets breeding.*—The main work of millets breeding was confined to (i) Cumbu (Rainfed), (ii) Irrungu Cholam (Rainfed), (iii) Ragi (Irrigated) and Vellai Cholam (Irrigated).

(i) *Cumbu (Rainfed).*—Strains Cumbu K.1 was distributed through seed farms. The hybrid strains X1 and X2 have been distributed in the districts of Madurai, Ramanathapuram and Tirunelveli to study the suitability of these strains, in the districts. Hybrid combinations in Cumbu have been made for testing their manifestation of Hybrid vigour and increased yield over the strain Cumbu XI.

(ii) *Irungu Cholam (Rainfed).*—A.S.7081 the extracted type of the cross between Irungu Cholam of Tirunelveli district and Periamanjal cholam of Coimbatore was distributed in the tract through seed-farms. Selection work for extracting bolder grained types of Periamanjal Irungu is in progress.

(iii) *Ragi (Irrigated).*—Strain Ragi K1 was distributed through seed-farms. Although the strain is a good yielder it has a defect that it lodges at the time of seed setting. Four non-lodging types have been isolated in F5. generation from a cross between strain Ragi K1. and an economic non-lodging type. Another economic pure-line Ragi KR4 with non-lodging habit has also been isolated.

(iv) *Vellai Cholam (Irrigated).*—Vellai Cholam K.2. was distributed through seed farms. Two economic cultures K.S. 288 and K.S. 296/54 giving higher yield than strain K2. have been fixed.

Agronomic studies—(a) Irrigated crops.—Three agronomic experiments, viz. (1) New cultural experiment, (2) Cereal Indigo experiment with superphosphate and (3) Cotton Pulses mixed trials were proposed to be conducted for one more year as they did not give conclusive results during the previous season.

(*b*) *Rainfed crops—Irrigation of black soil with brackish water.*—In Ramanathapuram and Tirunelveli Districts when wells were dug in black soil usually highly brackish water is obtained (400 to 500 parts of salts per hundred thousand parts). In many places wells have been dug and abandoned after one or two years of cultivation as the entire area became alkaline. But in some places where heavy doses of organic matter was used the cropping was a success. Invariably the crop grown was chilli as it is a paying crop. Trials to find out the optimum dose of compost and the ideal green manure plant to be grown and ploughed in have been laid out.

Poultry.—Rhode-Island-red breed of poultry was maintained. 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 Indian game breed. F.2 generation was raised and two hardy birds with good laying capacity has been fixed.

The Paddy Breeding Station, Mangalore (South Kanara district).

A. (i) *Paddy—Pure-line selection.*—Five cultures of first crop varieties, Kayama, Mascathy and Kanwa were under trial both at the Station and in the district. Three hundred singles plant selections in Hallugu were under observation. Representative samples of ryots bulk of Mascathy has been planted for selection.

(ii) *Improvement by introductions.*—The study of pureline cultures was continued with the addition of 32 strains and pureline cultures. Intervarietal trials of early promising varieties have been laid out.

(iii) *Improved by hybridization.*—F.2. progenies of three corsses MGL 1 × MTU 3, PTB 11 × MTU 4 and Kasipichodi × PTB 9 were under study for the evolution of non-lodging and non-shedding type of varieties.

(iv) *Manurial trials.*—Manurial trials were laid out to find out (*a*) deleterious effects (if any) on the continuous application of ammonium sulphate.

(*b*) the effect of high yielding strains on soil fertility;

(*c*) the relative merits of chilean nitrate and ammonium sulphate; and

(*d*) the efficiency of the two forms of phosphate, bonemeal and superphosphate.

(v) *Cultural trials.*—An experiment to test the relative merits of Japanese system and Farm system of cultivation was laid out during the first-crop season.

B. *Green manures.*—The suitability of Gliricidia malulata as a quick-growing plant yielding leaves in abundance, the quantity increasing with every cutting, was somewhat established. The value of sesbania speciosa as a good green manure crop making luxuriant growth during the south-west monsoon both as a pure crop in the dry area and along the periphery of bunds of the paddy area was also recognised. There was a keen demand for the seedlings of both the plants and a total of 307,200 seedlings and cuttings were distributed.

C. *Other crops*—(i) *Sweet potato.*—A manurial trial to find out the proper time of applying manure and a cultural trial for finding out the proper method of planting was laid out in the dry area.

D. *Miscellaneous crops*—(i) *Bananas.*—The banana crop in the single crop area maintained good conditions.

(ii) *Grasses.*—A collection of seven varieties of grasses was maintained and they made luxuriant growth during the monsoon season. A total of 40,500 slips of grass was distributed during the period.

(iii) *Vegetables.*—An area of 50 cents of dry area was sown to miscellaneous vegetables during the period.

E. *Miscellaneous plants*—(i) *Cover crops.*—Out of the three cover crops Kudzu, Calopogonium and Centrosema grown at the Station, the first two are coming up luxuriantly.

The Agricultural Research Station, Maruteru (West Godavari district).

Rice—Improvement of local varieties by pureline selections.—The two Pedda Atragada cultures 4,250 and 4,280 were tried in the Guntur and Kistna districts along with MTU. 12.

Promising hybrid cultures were sown along with controls. Progenies of short duration crosses were also grown. One hundred and thirty-two F. 4 selections from the cross progenies of MTU 10 and MTU 1, 166 F-2 and F-3 selections from Japanica and Indica crosses, 92 F-9 progenies of cyclic crosses of Akkullu varieties and 3 F-4 of natural cross progenies of Akkullu were grown during this period under review.

Manurial experiments.—The following co-ordinated manurial experiments were transplanted during the period under review:—

(*a*) *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. of P_2O_5 as super phosphate and 45 lb. of 'N' as ammonium sulphate as top dressing after transplantation an experiment was laidout in the main crop season with 10 treatments repeated four times with variety MTU. 1. Farm yard manure was applied at three levels—Viz., 2,500 lb., 5,000 lb. and 7,500 lb. per acre. Green leaf and compost were supplied on the organic matter basis of the above quantities of farm-yard manure.

(*b*) *Permanent manurial experiment.*—To find out the direct manurial value of organic manures and in-organic fertilizers and to find out the necessity of liming the soils for correcting the acidity, if any, is developed, an experiment was planted in split-plot design with ammonium sulphate, green manure, compost, cattle manure and no manure as main plot treatments and potash to supply 0 lb. and 60 lb. of K_2O lime to supply 0 lb. and 1,500 lb. and superphosphate to supply 0 lb. and 60 lb. P_2O_5 per acre as sub-plot treatments. The organic manures and inorganic fertilisers were applied each to supply 60 lb. 'N' per acre. The experiment was planted with variety MTU. 10.

(*c*) *Nutrient requirements of rice.*—Another experiment was planted with variety MTU. 1 to find out the economic dose of nitrogen and phosphoric acid for rice with four levels of P_2O_5 as superphosphate and of 'N' as ammonium sulphate (at levels 0,30,45 and 60 lb.) in combination.

(*d*) Another experiment was laid out with variety MTU 5 in the main crop season to find out the best method of application of phosphatic manures to rice either by direct application to rice or indirect application to preceding green manure crop and also to determine the best green manure that responds to this treatment in single and double crop areas with 45 lb. P_2O_5 as super phosphate per acre. The entire quantity of green manure obtained in each plot was ploughed 'insitu' after estimation.

(*e*) To find out the utility of Sesbania speciosa in the dry form an experiment was planted in the main crop season with the following four treatments, viz. (1) No manure, (2) Sesbania green at 4,000 lb. per acre, (3) Sesbania stooked and (4) Sesbania covered, on the basis of green matter.

(*f*) The experiment to find out the efficacy of the Japanese method of rice cultivation over farm method was laid out in the main crop season with two varieties MTU. 1 and MTU. 19. It was transplanted in the last week of July.

Fodder and green manure crops.—Sesbania seedlings were transplanted in the main crop season on the margins of rice field bunds to a total length of 34,630 feet. Glyricidia all along the boundary bund had good growth. A total quantity of 21,985 lb., i.e., about 9½ tons of green leaf was obtained from the plants on the boundary as well as those on the irrigation and drainage channels. Similarly a total quantity of 143,934 lb., i.e., about 65 tons of green manure from Sesbania crop was obtained either from crops grown on field scale or from plants grown on the margins of rice field bunds in the second crop season for utilisation in the main crop season. The perennial grasses grown in E-la were removed and planted on the tank bund for supply of slips to the public.

Seed distribution.—Paddy seeds to the extent of 199 lb. 30½ oz. of vegetable seeds, 10 oz. of gliricidia seeds, 4 lemon layers, 2 banana suckers, 1,068 bundles of paddy seedlings, 100 gliricidia rooted cuttings, 125 lemon cuttings, 25 spinach cuttings were supplied to the public as well as to departmental officers during the period under review.

The Agricultural Research Station, Nanjanad.

A. Potato—(i) *Great Scot—Seed multiplication.*—The popular variety, Great Scot, was raised during the main crop season and recorded the excellent acre yield of 10,907 lb.

(ii) *Varieties.*—The 26 varieties, received from the Netherlands in 1952 were further multiplied to study their yield performances and other qualities.

A total of 10 promising varieties and cultures was selected for further studies, from the materials received from the Potato Sub-station, Simla, through the Director, Central Potato Research Institute, Patna. One culture O.N. 2090 yielded very well, recording 12,700 lb. per acre. The materials were transferred to the Scheme of Potato Development of the Central Potato Research Institute, Government of India, which started functioning at this Station from the year 1954–55.

(iii) *Cultural trials.*—Mulching of the potato crop resulted in yield increases. Row spacing of 18″ gave yields higher than the wider spacing of 27″.

(iv) *Fungicidal trials.*—While Bordeaux mixture afforded the maximum protection against the Early Blight disease, the proprietory formulation Dithane Z. 78, resulted in maximum yields, consistently both for the year under report and the preceding two years.

(v) *Mulching trials.*—(1) Application of nitrogen in the combined form of ammonium sulphate and groundnut cake (as in Nanjanad mixture) proved favourable for yield increase, as in the last year; (2) increase in the quantity of nitrogen and phosphoric acid over that supplied by Nanjanad mixture did not result in higher yields; (3) liming or application of calcium carbonate slurry (a byproduct of the ammonium sulphate industry) was not beneficial; (4) spraying the crop with magnesium sulphate at 20 lb. magnesium oxide per acre, along with a basal dressing of slaked lime at 1,500 lb. per acre, gave promising indications, which have to be confirmed; and (5) supply of phosphoric acid content of Nanjanad mixture as a semi-acidulated phosphate (Kotka phosphate) was not useful.

B. Miscellaneous—(i) *Tree-planting.*—A total of 9,420 blue gums and cypress seedlings was planted and these are making steady progress.

(ii) *Seed supply.*—A total quantity of 13,625 lb. of potato seeds was disposed of.

(iii) *Exhibitions.*—One exhibition was held in connection with the Farmers' Day. The station partook in many local and mufassil exhibitions.

The Agricultural Research Station, Nandyal (Kurnool district).

Crop improvement.—The main item of work during the period consisted of sowings of cotton and jonna.

Mungari patcha jonna.—Pure culture and seed multiplication plots were raised in strains N. 10, N. 11 and N. 12 and pure seed supplied to the districts. Thirty-two selections collected from the Mungari Jonna tract were tried and promising selections were carried forward and sown. Eleven selections were tried in preliminary plot yield trial and N. 10 the control gave significantly superior yields. Pure culture and seed multiplication plots were raised in the juicy and pithy stemmed and gunda patcha jonna strains. Pure seed was supplied to the district for raising seed farms.

Korra.—Pure culture and seed multiplication plots were raised in strain N. 1 Korra for supply of pure seed to the districts.

District trials.—The trials were repeated for obtaining confirmatory data.

Cotton.—The breeding work on the white Northerns was continued under the auspices of the Indian Central Cotton Committee. The Cotton sowings were done in proper time, namely, the last week of August. The four strains 5202, 5001, 5975, 5289 along with two other promising families No. 6224 and 122 were sown in the replicated bulk yield trials with N. 14 as control. A replicated seed nucleus plot on a model bulk of each variety were also raised. Multiplication plots of about 0·63 acre each were also raised for five of the strains. The sowings included three sets of family blocks consisting of 23 promising families and 290 cultures in the progeny rows. A large number of first and second generation crosses were also raised in replicated and non-replicated rows. Due to the timely rains before and after the sowing, the germination was good in all the experiments. The Combodia cottons however suffered heavily from an attack of Black arm and Jassids resulting in a poor stand.

District trials.—The four strains, evolved through hybridization in the past possessing higher ginning of 30 to 33 per cent (as compared to 24 per cent for N. 14) and which were equal to N. 14 in spinning quality had not given conclusive results in the district trials due to seasonal conditions in the last two seasons.

The Regional Millet Station, Narasapatnam (Visakhapatnam district).

Millets.—Work was continued on the three major millets of the tract, viz., ragi, jonna and ganti.

(i) *Ragi—(a) Punsa ragi.*—Two series of compartive trials were conducted during this period. In one series, the trial with five Anakapalle local selections was repeated with A.K.P. 2 as control. This is the fourth year of trial. The differences were significant for yield and all the five selections, viz., A.R. 376–1–3, 363–1–4, 301–3–3 and 348–3–2 were significantly superior to control A.K.P. 2. A.R. 376–1–3 maintained its superiority during this year also and it was significantly superior to all the others in grain yields.

In series II, 7 local selections were compared in yield trials with A.K.P. 2 as control for the second year. The results of the first year, i.e., during 1952–53 were not significant. The results were significant this year and 3 selections, viz., N.R. 12, 13 and 25 were significantly better with an increased yield of 22 per cent than the control A.K.P. 2.

In addition 10 selections were isolated from a study of 106 single plants in observation plots.

(*b*) *Main ragi.*—The nurseries for main ragi selections were sown on 8th August 1953 and transplanted in the first fortnight of September 1953. Ten selections were sown under comparative trials and eight selections in preliminary yield trials were sown in nurseries with A.K.P. 7 as control plots.

(ii) *Jonna.*—In Patcha Jonna trials, 3 selections A.J. 138, A.S. 8108 and A.S. 7540 were sown in comparative trials with A.K.P. 1 as control. Thirty-five single plants were also sown in observation plots. In Tella Jonna trials two series of yield trials were sown. In one series 4 selections, A.S. 8008, A.S. 8085, A S. 475 and N.J. 72 were compared with A.K.P. 2 as control. In another series, 7 Coimbatore selections (A.S. 8407, 8408, 8409, 8410, 8411 8412 and 7657) were compared with A.K.P. 2. In addition, 35 Coimbatore selections and 60 locally collected single plants were sown in observation plots. The crop is on the field.

(iii) *Ganti.*—In comparative trials, the trial with 3 local selections was repeated with A.K.P. 2 and local as controls. In preliminary yield trials, 7 local selections and 10 Coimbatore selections were compared for yield with A.K.P. 2 and local in two series. The results are under tabulation. In addition 35 local single plants were sown and 18 promising selections were isolated.

(iv) *Pulses*—(*a*) *Redgram.*—In comparative trials five promising selections R.G. 264, 275, 434, 438 and 446 were sown and studied with R.G. 72 and local as control. The crop is in vegetative phase. In the study plots, 123 single plants were sown for isolating best selections suitable to the tract. These comprise of 42 hill types, 48 Virivada types, 3 exotic types and 30 types from plains of northern region. In addition two F. 1 hybrids, C : 38 × Hill Araku and R.G. 97 × Hill Araku were sown along with their parents with the object of isolating a type with broad pods and bushy growth. R.G. 72 was given for district trials in 27 centres while R.G. 97 in 15 centres.

(*b*) *Green gram.*—Moong T-1 was compared with G.G 127 and local in yield trials. The growth of the crop is satisfactory. In addition 39 single plant selections and 10 exotic types were sown in study plots G.G. 127 and G.G. 188 were given for district trials in 5 and 9 centres respectively.

(*c*) *Black gram.*—N.P. 14 was compared with VZM. 1 (B.G. 189) in yield trials along with local. The selections are yet to be harvested. In addition, 36 single plant selections including 8 extra-provincial types were sown in study plots.

(v) *Miscellaneous crops*—(*a*) *Paddy.*—G.E.B. 24 paddy nurseries were raised in first week of July 1953. Planting was done on 20th September due to late receipt of rains. It was raised in 1·95 acres. Observation plots of 12 cents area were planted with paddy in Japanese method as well as normal method.

(*b*) *Groundnut.*—Five bunch types of Tindivanam were sown in observation plots of 10 cents area with an idea to fix up a type for the tract with short duration and high yield. A.H. 6481, A.H. 4515, A.H. 4218, T.M.V. 2, A.H. 4111 were the variants of the trial. The crop was harvested in last week of September.

(*c*) *Gingelly.*—T.M.V. 3 Gingelly was raised in about two acres of land for seed multiplication and rotation purposes.

(*d*) *Fodder crops.*—Jonna A.K.P. 1, A.K.P. 3 and Co. 11 were raised for fodder in punasa season.

(*e*) *Green manure plants.*—Sesbania speciosa plants were raised on field bunds and road sides. Gliricidia seedlings were also planted in gaps on road sides.

The Regional Millet Station Ongole (Guntur district).

(i) *Jonna* (Sorghum Spp.)—Jonna J. 5 which had promising performance on the form was given out for trial in three centres at Ongole, Guntur and Narasaraopet in Guntur district and in Nandigama in Krishna district. Ten selections were to be tried under yield trials and eight selections in a preliminary comparative trial. A total of 92 selections were collected for study in observation plots.

(ii) *Variga* (*panicum miliaceum*).—In the variga yield trials, V. 94 had given more yield than local. It was therefore given for trial in Guntur district simultaneously trying on the station. Four plots were arranged in the taluks of Narasaraopet, Ongole, Guntur and Gurzala. Four selections in yield trials along with local, nineteen selections in three series of pre-comparative trials and sixty-five fresh selections in observation plots were tried.

(iii) *Agronomical work—Manurial trials on rainfed, millets.*—The results of the manurial trial conducted in 1952–53 with the treatment groundnut cake at 250 lb. per acre ammonium sulphate at 83 lb. per acre and no manure were not conclusive. The manured plots did not give increased yields over no manure plots. The experiment was therefore repeated this year.

The Agricultural Research Station, Palur.

1. *Paddy—Kar season.*—Eleven Sornawari cultures from Tirurkuppam were compared against TKM. 3 and SW. 7 and it was found that ten cultures gave increased yields over SW. 7. TKM. 3 grown on a bulk scale for seed multiplication recorded an acre yield of 3,186 lb. grain and this was multiplied on a large scale and distributed to primary seed farms.

2. *Millets.*—Ragi strain P. 1 and varagu strain P. 1 were multiplied and distributed for raising primary seed farm. A manurial experiment with P. 1 ragi was conducted to find out the relative merits of ammonium sulphate and chilean nitrate. During 1953–54 May to September season it was found that both chilean nitrate at 60 lb. nitrogen alone and ammonium sulphate at 40 lb. and 60 lb. nitrogen with the basal dressing of lime at 450 lb. P_2O_5 30 lb. and compost 3 tons per acre, were on a par and gave better results than the other treatments.

In mixed cropping trials with ragi, cotton and groundnut it was found that growing of a mixed crop of ragi—groundnut—cotton or ragi—groundnut has given the best return and it has also been found that the yield of ragi has not been affected when grown as a mixed crop with either groundnut or cotton or both.

3. *Miscellaneous.*—Varietal studies of tapioca showed that the variety Valenca was the best and heavy yielding for this locality.

4. *Seed distribution.*—Paddy seeds, to the extent of 4,040 lb., 142 lb. of ragi seed, 22 lb. of cumbu seed, 2 lb. of varagu seed, 612 lb. of oil seeds, 170 mango grafts, 403 lemon layers and 199 lb. of prosopis pods were distributed.

The Agricultural Research Station, Paramakudi.

Farm operations.—The Station started functioning from 1 April 1953 and the cultivation season starts only in September–October depending upon the north-east monsoon. As such the entire period covered by this report was spent in preliminary work connected with the starting of the station such as :—

(i) Ploughing the newly acquired lands with tractor and throwing them into plots of suitable size and shape ;

(ii) growing live hedge of *prosopis juliflora* along the boundaries of the two blocks of the station ;

(iii) *growing glyricidia maculata.*—Along the boundaries and margins of foot paths and field bunds for future supply of green leaf ; and

(iv) planting a number of fruit trees as per details given below.

Fruit trees.—The following fruit trees were planted during the period under report and maintained by pot watering :—

(1) Mango grafts	Bangalora	2
	Banishan	2
	Himayuddin	2
	Mulgoa	2
	Neelam	2
	Pairi	2
(2) Citrus	Malta lemons	10
	Jamberi	2
	Acid limes	10
	Sour oranges	1
	Pumello	2
	Sevilli limes	6
(3) Others	Sapota	2

The Deep Water Rice Station, Pulla (West Godavari district).

Paddy—Pure line selections.—Thirty-four numbers of single plant selections of Burma Akkullu were raised to select suitable strains for deep water conditions.

Hybridization.—As the varieties did not put forth ear-heads during the period under report no hybridization work was carried on.

Vegetable cultivation.—As the fields are liable for submersion, there was little scope for cultivation of vegetables in the farm except on a high level piece. Bendai, ribbed gourd, bottle gourd, amaranathus and gogu, were raised for collection of seed. Except amaranathus and gogu, the rest of the vegetables came up well.

Other crops.—Nurseries were raised with Glyricidia and Sesbania. Twenty thousand plants of Sesbania and 3,500 plants of Glyricidia and 5,000 plants of Prosopis juliflora were planted on the field bunds. Sesbania and Glyricidia established well. But 90 per cent of Glyricidia and Prosopis plants died due to submersion at a later stage.

Pests and diseases.—The seeds of all the varieties before sowing, were treated with Agrosan, G. N. There was a sudden out-break of swarming caterpillar in the third week of August affecting G.E.B. 24 and S.R. 26-B. crop and dusting with 112 lb. of Gammexane D.025 and D.120 and Gueserol 550 were done and the caterpillar was controlled to a great extent. Rat damage was severe during the period. Early varieties like Basangi, MTU 20, T. 2205 and T. 2208 were damaged and rats were killed by engaging professionals and exterminated by baiting with Zinc Phosphide. Yet they could not be controlled effectively.

Seed distribution.—One thousand one hundred and twenty pounds of seed were distributed, which would be sufficient to cover about 45 acres.

The Agricultural Research Station, Samalkota (East Godavari district).

Rice—Comparitive yield trials of paddy.—Fourteen Basangi and Krishnakatukulu cultures were under comparative yield trials for the last three seasons in three series with MTU-3, SLO-9 and SLO-15 as controls. MTU-3, GPT-8, GPT-43 and G-T-5 are found to be promising.

Three Sannabasangi cultures, viz., Culture Nos. 3778, 3780 and 3781, were under yield trials for the first time with MTU-3 as control. Culture No. 3778, was found to be promising.

Three Sannakonamani cultures, viz., Culture No. 1543, Culture No. 1545 and Culture No. 4214/5 were under yield trial with SLO-15 as control. This was the first year of trial. Culture No. 4214/5 is found promising.

Three cross progenies of MTU-5 × MTU-10 were under trial for the third year with MTU-5, MTU-10 and SLO-15. Culture No. 10175 was vigorous in growth and tillering.

Five cross progenies of the cross between MTU-19 × SLO-17 and (Culture Nos. 9942, 9952, 9990, 10235 and 10255) were under trial with the parents. None of the cultures were found encouraging over the parent SLO-17.

Two promising cross progenies of the cross between SR-26-B × MTU-1, namely, Culture No. 10022 and 10034 were under yield trials with the parents for the first time. Culture No. 10022 and SR-26-B were found promising.

Manurial Trials.—Organic matter requirements of soil : This was the second year of trial. The manuring consists of the application of organic matter in three levels in the shape of farm yard manure, compost and green manure. SLO-13 is the variety tried. The crop grew rank and prelodged.

Nutrient requirements of paddy.—This was the second year of trial. SLO-13 is the variety tried. Nitrogen at four levels and phosphoric acid at four levels, viz., 0 lb., 20 lb., 45 lb. and 60 lb., per acre were applied singly and in different combinations. Due to rank growth the crop prelodged.

Permanent manurial experiment.—The object is to find out the direct manurial value of organic manures and inorganic fertilizers and to find out the necessity of liming of paddy soils for correcting acidity if any is developed. This was the second year of trial. The trial was conducted with 5 major and 8 minor treatments. The plots that received green manure produced rank growth and prelodged.

Phosphatic manures on paddy.—This was the second year of trial. SLO. 13 is the variety. The object is to find out the effect of phosphates applied direct to paddy crop and through the preceding crop of green

manure. Sunnhemp, Daincha, Wild Indigo and Sesbania are the green manures grown. There was practically no difference regarding growth between the two methods of application of phosphates to paddy.

Studies on the effect of application of Sesbania in fresh and dry forms on the paddy fields.—Practically there were little differences in growth among several treatments.

Agronomy.—Japanese method of rice cultivation was compared with the departmental method. Two varieties, viz., MTU-1 and MTU-19 were selected for the trial. Both the varieties were very vigorous and healthy in Japanese method than in the Farm Method.

Pests and diseases.—Six cultures were compared with SLO-1 and SLO-17 to study their comparative resistance to Helminthosporium disease. This is the first year of trial. The percentage infection of leaves on the plant varied from 55 to 100 and SLO-1 was least affected.

Comprehensive Coconut Nursery Scheme.—From 1952 nursery 16,310 selected seedlings were distributed.

Miscellaneous.—The garden land and high bunds were mainly utilized for growing fodder grasses, fruit trees and a few vegetables. The following seed materials were transferred to the district staff during the period under report.

Particulars.	Quantity.
(1) Prosophis pods	450 lb.
(2) Sesbania seed	400 lb.
(3) Grass slips	6,300 Nos.
(4) Vegetable seed	1 lb.

The Rice Research Station, Tirurkuppam.

Paddy Improvement Work.—Selection work was continued in the main variety in the Sornavari season. Out of seven Sornavari cultures two cultures that gave significantly increased yield over TKM. 3 and four others that gave more yield than TKM. 3 standard were carried over.

Hybridization.—Two progenies of crosses between season and period bound strains, two blast resistant progenies of Co. 13 × Co. 4 and 28 secondary selections from crosses between season and period bound strains were carried over for further study and observation.

In the trial on Japanese method of rice cultivation versus farm method, though the Japanese method gave more grain yield than farm method, it was not commensurate with the extra expenditure involved in Japanese method.

Other crops.—Crops of ragi, gingelly TMV. 3 and tapioca were grown. P. 216 F. cotton in rice fallows was grown and an acre yield of 1,000 lb. of kapas was obtained. Vegetable crops like gourds, cowpea, cucumber were grown and seeds were collected. Fodder grass like Guinea grass, Thin napier grass, Water grass, Blou buffel grass, Australian drought resistant grass, F_1 of cumbu × elephant grass and fruit plants like lemons, sathugudi, papaya, Singapore jack and bananas; and green manure crops of sunnhemp and sesbania and greenleaf yielding shrubs and trees—Calotropis Adathoda, Ipomoea carnea, Cassia auriculata, Cassia siamea, Gliricidia and Pongamia glabra were grown.

Seed distribution.

Particulars.	Quantity.
Paddy seeds	1,217 lb.
Ragi seeds	462 lb.
Vegetable seeds	26 lb.
Glyricidia Maculata	6 lb.
Glyricidia seedlings and cuttings	20,000 Nos.
Gram slips	5,800 Nos.
Fruit plants	200 Nos.
Paddy seedlings	9 cents.

The Agricultural Research Station, Tindivanam.

A. Groundnut.—Three bunch strains from the States of Bombay, Madhya Pradesh and Mysore were sown for the third time for comparison with TMV. 2 strain. Two spreading strains from the States of Punjab and Uttar Pradesh were put under comparative yield trials along with local groundnut TMV. 1 and TMV. 3 strains. Three selections from Local Mauritius and fourteen selections from big seeded types were sown under comparative yield trials for comparing their yield performance with the local TMV. 1 and TMV. 3 strains. Seven dormant bunch selections and eight spreading selections were sown in preliminary yield trials in two separate series with TMV. 2 as control for the bunch and local and TMV. 3 as controls for the spreading selections. Seventeen bunch and twenty-seven spreading selections were sown under replicated row tests with TMV. 2 and AH. 1 as controls for the bunch and spreading selections respectively. One hundred and fifty-one bunch and 184 spreading selections were sown in single rows with a row of control after every two selections. TMV. 2 served as control for the bunch and AH. 1 for the spreading selections. Twenty-four new crosses have been programmed during this season. The progenies of earlier crosses were raised along with their parents for detailed study. Agronomic experiments, viz., the rotation experiment, cultural experiment, mixed cropping experiment, manurial experiment and spacing trials were laid out as in the previous years.

B. Gingelly—1953 Summer.—Two selections from varieties and four colour grade selections were compared with local gingelly and the strains in two separate series. The differences were not statistically significant. The preliminary yield trials with 6 selections failed as the plants wilted in large numbers. Twenty selections were multiplied in small plots. Twenty selections were put under replicated row tests and among them nine selections yielded higher than the control. In the row tests out of 42 selections, 15 were promising, spacing trials were the spacing 1′ × 1′ recorded the highest yield. All the varieties and new additions from America were raised and studied. Hybridisation work with the object of evolving a white seeded type and cosmopolitan types was taken up.

C. Castor.—Three strains from the States of Bombay, Uttar Pradesh and Madhya Pradesh were sown under comparative yield trials along with TMV 1 and TMV 2 for the second time. Five selections from progenies of crosses were put under comparative yield trials for comparison with TMV 1 and TMV 2 for the third time. Thirty-two selections from progenies of crosses were sown in replicated rows for comparison with TMV 1 and TMV 2 strains. Seventy selections were raised in single rows for detailed study of purity and

yield performance. Progenies of crosses effected during previous seasons were raised along with the parents for detailed study. Five new varieties received from America were raised in observation plots for study.

D. Miscellaneous.—Fodder cholam was sown in an increased area during this period as compared with last year. Gliricidia and Sesbania were raised on an extensive scale and a large number of seedlings was distributed to the cultivators during this period.

E. Seed distribution.—The following seed materials were distributed during the period:—

	LB.
Groundnut seed pods	9,693
Gingelly seeds	277
Castor seeds	501
Paddy seeds	10,160
Vegetable seeds	25
Gliricidia and Sesbania seedlings	101,230 Nos.
Seedlings of economic trees	16,780 Nos.

The Agricultural Research Station, Taliparamba.

(*a*) *Paddy*—(i) *Comparative yield trial of different strains.*—The comparative yield trial of different strains of paddy was planted.

(ii) *Comparative trial of compost made of dried jack leaves, mango leaves and cashew leaves.*—The trial to assess the comparative merit of compost made with dried leaves of jack, mango and cashew was initiated.

(*b*) *Chilli—Comparative yield trial of different types.*—The comparative trial of three types of Chilli, South Malabar, G. 1 and G. 1402 was planted out.

(*c*) *Fruits*—(i) *Sapota rootsock trial.*—Observations and datafrom the trial were recorded.

For initiating trial of hormones on pineapple and jack rootstock trial, preparing the necessary planting material was in progress.

(*d*) *Pepper.*—A trial on the spraying of insecticides for control of Pollu was initiated.

New Introduction of fruit and other crops.—Yellow passion fruit, Vanilla and four varieties of arecanut were introduced in the station and planted.

Other crops.—Vegetables, green manure and cover crops were grown for trial and supply of seeds.

Compost.—A total quantity of 16 tons of compost was prepared during the pariod under report.

Seeds and plants distributed.—The undermentioned seeds and plants were distributed during the period under report—

Malta lemon plants	1,172
Sapota seedlings	3
Sapota grafts	374
Mango grafts	789
Jack seedlings	375
Jack grafts	2
Mangosteen seedlings	40
Roseapple seedlings	61
Guava layers	21
Carambola seedlings	6
Mango seedlings	600

Pineapple suckers	250
Banana suckers	25
Brinjal seedlings	320
Chilli seedlings	6,300
Arecanut seedlings	1,132
Pepper vine cuttings	1,400
Guinea grass slips	300
Indian Gooseberry seedlings	21
Cashew seeds	14
Vegetable seeds	5 lb. 14 oz.

X. CROP SAMPLING.

This is the fourth report, since the commencement of the Five Year Co-ordinated Scheme of Crop Cutting Experiments and statistical assessment of the results due to Grow More Food Aids. The report covers the period 1st July 1953 to 30th September 1953, and relates to the Composite State.

2. *Staff and Administration.*—The technical control of the Scheme continued to vest in the Economic Adviser to Government assisted by one Assistant Statistical Officer and one Special Deputy Director of Agriculture (Crop Sampling) at Headquarters and eight Special Direct Agricultural Officers at eight centres. Crop cutting experiments were conducted as in the previous years on the principal food crops, viz., (i) paddy, (ii) cholam, (iii) cumbu and (iv) ragi. The experiments for the assessment of the results due to Grow More Food Aids were confined to the three principal aids, viz., (i) improved paddy seed, (ii) green manure and (iii) ammonium sulphate. The field work relating to the experiments on paddy and the statistical assessment of the results due to Grow More Food Aids were attended to by the Agricultural Demonstrators, while experiments on millets, viz., cholam, cumbu and ragi were attended to by the Revenue Inspectors.

3. *Work done.*—The season just commenced and the period of three months was too short a period for any experiment to be completed. Further crops sown during the period in the several regions differ and a comparative study is therefore not possible. Hence particulars showing the number of experiments planned and the number laid during the period under report are not given. These are however given in Part II of the report in respect of Residuary State only.

The average number of days toured during the period by the several Special District Agricultural Officers was 45 days while the number of villages and experiments inspected by each worked out to 26. The Special Deputy Director of Agriculture (Crop Sampling)/Senior District Agricultural Officer (Crop Sampling) toured for 22 days visited 4 villages and inspected 2 experiments. Statement enclosed gives details in respect of each officer separately. The work of the Special Deputy Director of Agriculture (Crop Sampling) during the period related mainly to inspection of offices of the Special District Agricultural Officers (Crop Sampling) besides attending the College day conference at Coimbatore. The Special District Agricultural Officers (Crop Sampling) besides inspection of experiments at different stages, conducted training classes for the Revenue Inspectors at the Survey Training Schools opened in selected centres and imparted training on Random Sampling Technique to be adopted in conducting the Crop Cutting Experiments.

Statement showing the work done by the Officers in charge of the Crop Cutting Experiments.

Designation of the Officer.	Number of days toured.	Number of villages visited.	Number of experiments inspected.
1 Special District Agricultural Officer (Crop Sampling), Madras	31	11	20
2 Special District Agricultural Officer (Crop Sampling), Salem	40	20	24
3 Special District Agricultural Officer (Crop Sampling), Madurai	52	42	55
4 Special District Agricultural Officer (Crop Sampling), Tanjore	47	26	18
5 Special District Agricultural Officer (Crop Sampling), Shoranur ..	46	54	55
6 Special District Agricultural Officer (Crop Sampling), Vijayawada ..	33	18	..
7 Special District Agricultural Officer (Crop Sampling), Kakinada ..	58	22	22
8 Special District Agricultural Officer (Crop Sampling), Bellary	53	14	11
Total ..	360	207	205
Average ..	45	26	26
Special Deputy Director of Agriculture (Crop Sampling)	22	4	2

XI. TUNGABHADRA PROJECT.

Agricultural Research Station, Siruguppa.

The station was started for studying the effect of irrigation water on the movement of salts in the soils of the Tungabhadra Project area and determining crops, cultivation methods, etc., suitable for the ayacut. The fundamental studies on the physicochemical reactions of the blacksoils to irrigations were continued.

Agronomic studies.—Trials with Korrapalli mixture Hingari Jola. Hingari and American cotton varieties and paddy varieties were continued.

In the varietal trials, redgram varieties, groundnuts—bunch and spreading and sweet potato varieties were continued to be grown.

Paddy varieties Co. 2, ASD. 5, ADT. 18, MTU. 15 are being tried in September—October plantings for testing their suitability for the inter season.

In the manurial experiments, super phosphate and dicalcic phosphate were tried in combination with groundnut cake with different methods of application. Rock phosphate experiment is being continued. Japanese method of paddy cultivation is being tested. Green manure trials with paddy and korra manurial trials were laid out.

In the cultural trials four and third year rotation experiments and mixed cropping were continued.

Pest control trials were pursued on cholam-fly, aphids, bollworm and assids on cotton.

The following quantities of seeds were distributed :—

	LB.
Paddy	2,450
Jola	25
Wheat	50
Cotton Laxmi	1,510
MA. 2 cotton	100
Groundnut	344
Sesbania	75

Bagawadi demonstration farm.—The ryots of the Bagawadi demonstration farm have adopted the improved methods of raising crops successfully under irrigation on the lines advocated by the department. The following crops were raised by them :—

	ACS.
Jola Co. 9	24·65
Patcha Jola	25·00
Korra	16·00
Cotton Laxmi	40·41
H. 1	15·00
Paddy	2·00
Chillies	1·30
Onions	0·05
Sweet potato	0·02

XII. COLONIZATION SCHEMES.

1. *Arakuvalley Scheme* (*Visakhapatnam*).—Research work on the farm and extension work in the neighbouring areas were also done under the scheme.

Research work.—Introduction of strains of Paddy, Millets and Oilseeds and evolution of superior strains in local paddy and millets was pursued. Commercial crops as groundnuts, vegetables and short-term food crops as sweet potato were introduced. Experiments with manuring with cattle manure and trials to conserve soil and water by contour bunding were carried on. Introduction of fruit plants was continued. Subsidiary industries as dairy, poultry, pisciculture and sheep rearing were demonstrated.

Extension work.—With the help of 7 demonstration maistries, the farm staff carried on extension work. They laid out 14 demonstration and 6 observation plots. Six propaganda meetings and one exhibition were held in the colony area. The following are the particulars of improvements introduced :—

Green manuring	245 acres.
Growing Sesbania along bunds	105 ,,
Vegetable-indigenous and exotic	44 ,,
Sweet potato	18 ,,
Compost prepared	205 tons.
Improved cattle sheds	262 Nos.

2. *Wynad Colonisation Scheme—Research work.*—Work of evolution of superior strains in paddy was continued. Seeds of promising strains Palthondi, Marathondi, Velumpala, Chettivalian, Kothandan, Maravellu, S.L.O. 17 and MTU. 19 were multiplied.

Research in fruits—Cultural, manurial and varietal trials were continued as per programme.

Three spices, Cacao, root crops, pulses, chillies, sugarcane, pepper and coffee were continued. Dairy and poultry units were maintained for demonstration.

Seed distribution was as follows :—

Paddy strains	413 lb.
Fruit and other economic plants	23,976 Nos.

Extension work.—Propaganda was carried on for cultivation of crops on improved lines, green manuring; application of chemical manures and soil conservation. The following are the achievements :—

Ploughing with tractors	49 acres.
Levelling	10 ,,
Contour bunding	312 ,,
Contour planting	340 ,,
Green manuring	606 ,,
Application of chemical manures	262 tons.
Paddy seeds	430 lb.
Compost	75 tons.
Plantation crops, orange, coffee and bananas ..	125 acres.
Pine apple suckers	560 Nos.
Plant protection work	22 acres.

XIII. PROPAGANDA, DEMONSTRATION AND PUBLICITY.

(Extension Work.)

Propaganda.—The Agricultural Extension Staff intensified efforts on propaganda and extension work on the several schemes of the intensive food production plan, cotton extension and sugarcane development included in the Five-Year Plan of the State. Special emphasis was laid on the Japanese method of paddy cultivation modified to suit the conditions in the State, on raising *sesbania speciosa* as a border crop in paddy fields, sinking filter point tube well scheme, intensive manuring of paddy with fertilizers, better methods of raising sugarcane, crop yield competition in paddy and sugarcane, formation of agricultural associations and raising village seed farms of paddy. The extension staff toured the villages frequently holding meetings and constantly conducting demonstrations on ryots fields. In all, 8,882 propaganda meetings were held and 8,860 demonstration plots were laid during this quarter to bring home to the cultivators the use of improved seeds, manures and better cultural practices. Large scale campaigns for adopting control measures against insect pest and fungoid diseases were also organized with a similar purpose.

Agricultural association.—Agricultural associations for every village and at taluk level were sought to be organized. During the period under report 21,916 agricultural associations were functioning in the State. New associations were formed in villages and membership and working of existing

ones was endeavoured to be improved. Response was in general satisfactory. Popularising the modified Japanese method of paddy cultivation, growing sesbania in paddy along borders, raising village seed farms of paddy strains, compost making, tree-planting and other agricultural implements were put through the members of these associations for better effects.

Publicity.—Publicity for agricultural improvements was mainly through the Grow More Food Journals published monthly in the four regional languages—Tamil, Telugu, Malayalam and Kannada. Popular articles on modified Japanese method of Paddy cultivation, improved strains of crops, cultivation of cotton in rice fallows, raising green manure crops, etc., were some of the topics published. Besides articles from the animal husbandry, Fisheries and Co-operative department were also included.

The following is the strength of subscribers at the end of the period under report :—

	Nos.
Mezhichelvam	26,699
Padipantalu	30,648
Naveenakarshakan	4,097
Krisikkarabandu	2,222

Popular booklets on plant protection work in the districts, pests and diseases of oranges, hedge plants, avenue trees, pepper, tree spices, tobacco, chillies, reclamation of alkaline lands, etc., and leaflets on cotton, sugarcane, etc., were published and made available to the public.

Radio as a means of publicity was made use of and the following topics were broadcast from the All-India Radio Stations in the State :—

Date of Broadcast.	Subject of the talk.	Language and station from where broadcast.
20th July 1953 ..	Talk on manuring ..	In Telugu from All-India Radio, Madras.
19th August 1953 ..	An appeal to cotton growers and consumers in Madras State.	Do.
22nd August 1953 ..	Increasing production of oil seeds in Madras State.	All-India Radio, Tiruchirappalli in Tamil.

Exhibitions.—Exhibitions were organized in connection with all important fairs, festivals and during social, political and religious gathering to give wide occular publicity for improved agricultural practices. On the occasions, besides putting up exhibits and posters, demonstrations with improved agricultural practices were arranged. In all thirty-nine exhibitions were held during the period under report.

Crops—(a) Paddy.—Multiplication and distribution of improved strains of paddy formed the chief item of work as improved seeds increased production by 10 to 15 per cent. Special Seed Development staff was continued to look after the primary seed farm work and check up the purity and viability of seeds produced from secondary seed farms. The

following are the primary and secondary seed farms organized with quantities procured from them during the period under report :—

	Average acres.	Quantity of seeds procured.
Primary seed farms	3,130	389 tons.
Secondary Seed farms	10,343	

A total quantity of 1,684 tons of improved paddy seeds was distributed up to 30th September 1953.

(*b*) *Millets.*—The following are the particulars of Millet seed farms arranged and seed procured for distribution.

	Average acres.	Quantity of seeds procured.
Primary seed farms	672	22¼ tons.
Secondary seed farms	1,718	

A total quantity of 163 tons of improved millet seeds was distributed during the period under report.

(*c*) *Pulses.*—The following are particulars of the areas of seed farms organised and seeds procured of improved pulses strains:—

	Average acres.	Quantity of seeds procured.
Primary seed farms	34	357 lb.
Secondary seed farms	112	

Procurement is small as the main season for harvest is yet to be reached.

Cotton.—Distribution of improved cotton seeds on a large scale under the Cotton Extension Programme was done. Seeds of the improved strains were multiplied on a large scale in special seed multiplication schemes and seeds of improved strains from outside as P.216.F. and H.420 were purchased. During the period under report the following areas of seed farms were organized and seeds procured :—

	Seed farm.	Acreage targetted.
Co2 in Central districts	500	(Seeds procured are given in part II of the report.)
MCU.1 ,, ...	6,000	
K.5 ,, ...	10,000	
MCU.1 in Southern districts	4,000	
MCU.2 ,, ...		
K.2	30,000	

In H.1 cotton seed multiplication scheme, Guntakal, 4,587 bags of seed were procured and distributed.

A total quantity of 204 tons of cotton seeds of all improved strains was distributed till September 1953.

Oil seeds.—Six zonal seed farms were run for multiplication of groundnut and castor and special coconut nurseries in nine centres continued to produce quality seedlings. These were partly financed by the Indian Central Oilseeds Committee and Indian Central Coconut Committee, respectively. The following are the particulars of improved seeds and seedlings distributed :—

Groundnut pods	10,010	lb.
Kernels	952	,,
Gingelly	207	,,
Caster	458	,,
Coconut seedlings	104,240	Nos.

Fruits.—Choice grafts, budedd plants, seedlings layers and cuttings of fruit plants were made available from Government Fruit nurseries and Fruit centres to the extent of 53,980 fruit and other plants.

The special fieldmen posted in Kodaikanal did propaganda for extension of fruit trees. A special drive for distribution of fruit plants were given whenever stock accumulated in nurseries reducing prices even, in special cases.

Vegetables.—The production of vegetables was encouraged through departmental distribution of seeds even though the scheme for free supply was discontinued. The special staff for the Madras City continued to function and did good work. About 453 pounds of vegetable seeds and 10,890 vegetable seedlings were sold. Over 1,741 bungalow owners were contacted and over 110 acres of vegetables were dealt with. Besides supply of seed material, manures and fertilizers were supplied and insect pests and diseases were controlled. In the districts 1,423 lb. of vegetable seeds were distributed.

Sugarcane—Extension work.—The development staff attended to the extension work, doing propaganda on improved cultural techniques to increase the average yield of sugarcane, and sugar recovery, and to bring home to the cultivators the advantages of application of the correct quantity of concentrates at the proper time. Planting sesbania around the cane fields to supplement the basic applications of organic matter to the soils was advocated as a cheap and ready method, besides the practices of growing green manures in cane rows. On the cultural side, inter-cultivation by bullock-drawn implements, trench planting with subsequent earthing up, trash twist propping, providing better drainage facilities, removal of uneconomic tillers, improvement in the cultivation of ratoons and removal of smut whips, etc., were some of the important items tackled.

Besides the above, the '*Pest Act*' was kept in operation in the Kulittalai area.

Manures.—Crop production can be maintained and augmented only by systematic manuring specially so under irrigation. Hence substained propaganda was carried on for adequate manuring of all crops.

(*a*) *Cattle-manure.*—Cattle manure forms the major part of all manures available for manuring crops. But proper attention is not paid in its preparation and conservation. So propaganda for preparation and preservation in properly made cattle sheds and pits was emphasised and the following are the achievements :—

Manure pits newly opened	17,054
Manure pits renovated	18,361
Byre system for conservation of urine, etc. ..	1,155
Dry earth system	8,709
Loose box system	630

(*b*) *Composts.*--Propaganda was done for conversion of all available waste vegetable material into useful composts to supplement the cattle manure for manuring crops. The compost week was celebrated along with Vanamahotsava during July 1953. In all 49,828 tons of composts were estimated to have been prepared during the period under report.

Propaganda was also done for the next extensive use of urban composts prepared by municipalities and panchayats from town refuse and nightsoil. The prejudice against the use of these composts is gradually giving way and during the period under report 61,530 tons of compost have been distributed from municipalities and panchayats.

(*c*) *Green manures.*—In order to increase yields and supply organic matter intensive propaganda was done for bringing large paddy areas under green manuring. As *Sesbania* was found cheapest and best as a border crop in paddy fields and for raising in rice fallows as a pure crop it was introduced on a large scale. Over 200,000 acres were brought under *Sesbania* as a border crop and 54 tons of *Sesbania* seeds were sold during the period under report. Other green manure crops as daincha, sunnhemp, oolingi were also encouraged in suitable localities.

Growing green manure between rows of sugarcane in early stages for green manure was also advocated.

Planting of *Glyricidia maculata, Pungam, Malaipoovarasu, Ipomea carnea,* which are quick growing perennial plants producing large quantities of green matter, in all waste lands, bunds and channel sides was advocated and large quantities of seed material seedlings and cuttings were made available.

(*d*) *Fertilizers.*—As a measure of increasing crop yields quickly and to supplement, cattle-manure composts and green manures, fertilizers were largely advocated for paddy, sugarcane and cotton. Small ryots were helped with loans for the purchase and use of chemical fertilizers as ammonium sulphate and super-phosphate. In all 44,034 tons of ammonium sulphate and 5,730 tons of super-phosphate were distributed during the three months.

(*e*) *Loans.*—To enable poor cultivators to take up cultivation in time, loans up to Rs. 120 in each case for purchase of seeds and manures and Rs. 100 for implements are being disbursed. The following amounts were sanctioned during the period under report.

	RS. LAKHS.
For seeds and manures	5·0
For implements	0·02

Besides, loans under Intensive Manuring Scheme were issued to the extent of sixty lakhs for purchase of chemical manures.

Fodder crops.—As natural grazing is not available to the required extent, the growing of fodder crops for cattle was encouraged. Fodder seeds to the extent of 2,085 lb. and slips of fodder grasses (30,777 numbers) were made available to interested ryots.

XIV. HILL TRIBES UPLIFT SCHEME.

(*a*) *Agency Development in Visakhapatnam district.*—Two Special Agricultural Demonstrators stationed at Gummalakshmipuram and Seethampeta attended to extension work in the Agency areas and introduced improved agricultural practices.

Yenadies in Chittoor district.—To encourage the Yenadis in Agriculture distribution of seeds freely was continued, and during the period under report 15½ tons of seeds of paddy, millets, pulses and cotton were distributed free.

(*b*) *Todas in Nilgiris.*—To enable the Todas to take to settled agriculture, and to give up their nomadic life, seed potatoes and manure mixture were made available on loan to them. They were also taught improved agricultural practices through the Special Agricultural Demonstrator appointed.

XV. VANAMAHOTSAVA.

Vanamahotsava (National tree planting week) was celebrated along with the compost week in all the districts during the first week of July 1953. Required seeds and seedlings of useful plants and trees were distributed in co-operation with officials and non-officials. Seeds and seedlings distributed are shown below :—

	NOS.
Fruit tree seedlings	163,537
Cuttings of economic importance	730,402
Other seedlings of economic importance ..	4,219,814
	LB.
Seeds	19,489

XVI. AGRICULTURAL MARKETING.

Market surveys.—Work regarding market surveys continued side by side with the development programme. Supplementary information was furnished to Agricultural Marketing Adviser to the Government of India, New Delhi, on the following :—

(*a*) Production and marketing of lac.

(*b*) Data for revised report on the production and marketing of animal fats and by-products of the All-India Report.

(*c*) Supplementary information for the report on the marketing of tapioca in Madras State for revision of the All-India Report.

Information was sent to Agricultural Marketing Adviser on the details of export of palmyra stalks from Madras State and marketing of palmyra products through co-operative societies.

Movement data of all major commodities from important railway stations were collected and compiled as usual.

2. *Grading of commodities—Ghee.*—Six grading stations for ghee, functioned during this period, two at Tiruppur, one each at Coimbatore, Madurai, Ongole and Guntur. The total quantity of ghee graded during the peribd was 3,188 maunds and 12 seers valued at Rs. 5,48,198. The ghee so graded was marketed mostly in North Indian Centres of Calcutta and Delhi.

Eggs.—Six authorized packers were engaged in grading of eggs during this period. A total of 232,075 eggs valued at Rs. 29,516 were graded in the period under report.

Fruits.—The two fruit grading stations at Kodur and Rajampet (one for oranges and one for lime) did not attempt any grading during this period for want of gradeable quality in the local production.

Potatoes.—Of the two authorized packers for potatoes, one at Ketti and the other at Mettupalayam, the latter alone accounted for grading a total quantity of 2,860 maunds valued at Rs. 48,972.

Rice.—Three applications for grading rice under 'Agmark' were obtained during this period but actual grading was not commenced.

Other produce.—Grading of jaggery remained suspended at Chittoor.

The work on grading of tobacco and sunnhemp are administered exclusively by the Directorate of Marketing and Inspection of the Government of India with special staff under its direct control. The State Marketing Officer is concerned only with recommending applications for certificates of authorization. Three applications for grading of tobacco were forwarded to Agricultural Marketing Adviser to the Government of India, New Delhi, during this period.

The total value of Agmark produce excluding tobacco and sunnhemp, was Rs. 6·3 lakhs during the period 1st July 1953 to 30th September 1953 (vide Appendix).

3. *Regulated markets.*—Regulations of markets had been in progress only in respect of five crops, viz., cotton, tobacco, groundnut, coconut and arecanuts, out of seven declared as commercial crops under the Madras Commercial Crops Market Act, 1933. The administration of the market committees remained under the control of the Director of Agriculture, Madras. The details of the benefits extended under this Act are furnished in table below :—

Districts covered.	Name of crop.	Total area in the State (in acres in 000).	Area benefited by the Act (in acres in 000).	Percentage of area benefited
(1)	(2)	(3)	(4)	(5)
				PER CENT
	Andhra areas.			
Bellary— Anantapur	Cotton	985	726	74
Nandyal— Nandyal	Groundnut ..	2,564	991	38·6
Guntur— Vizayawada	Tobacco ..	336	263	78·2
East Godavari— East Godav ri ..	Coconuts ..	84	58	69
	Other areas.			
Coimbatore .. .. Tirunelveli .. .. Ramanathapuram .. South Arcot	Cotton	881	690	78·4
South Arcot .. .. North Arcot .. .. Coimbatore	Groundnut ..	1,938	1,184	61·0
Malabar .. .. South Kanara	Coconut	559	455	81·5
South Kanara	Arecanut ..	114	111	97·3
Coimbatore	Tobacco	54	33	61·5

The progress of work in the regulation of markets for commercial crops met with complications during the period due to certain sections of the trade which attempted to sabotage regulation of any kind in buying and selling. A challenge against the validity of the Act was put forth through writ petitions in the High Court by the traders of East Godavari, Malabar, Coimbatore, Ramanathapuram and Tirunelveli districts. The High Court held the Act valid except for the unsustainability of discretionary refusal of licence or registration and curtailments without such licence or registration.

The eight regulated markets in the South Arcot district accounted for a transaction of 15,275 tons out of 15,858 tons marketed in all the eight centres. The arrivals in these markets were entirely voluntary and all transactions were put through under Chit tender closed bid auction, The progress of auction sale of tobacco continued to be satisfactory, in Guntur Market and less so at Tadikonda and Mangalagiri markets. The enforcement of sales under regulation in only three markets of the district leaving the major areas without similar markets was a constant source of dissatisfaction. The regulated markets at Adoni (Bellary district) and Tiruppur (Coimbatore district) continued to function satisfactorily during the period. The Market Committees of Anantapur and Bellary had made fair progress, in the preliminary arrangements for opening markets. The East Godavari Market Committee at Rajahmundry which was in the charge of the Collector, under section 6-A of the Act, was handicapped by the opposition created by the traders who challenged the validity of the Madras Commercial Crops Market Act.

4. *Market Intelligence.*—Many enquiries for market information from growers and traders were replied. Disposal of P. 216 F cotton grown by Annamalai University was arranged. The section made arrangements with the railways to move the cotton stock accumulated at Tadpatri rapidly.

Weekly, fortnightly and monthly prices prevailing in the chief market of all agricultural commodities were maintained. The Coimbatore Market Committee issued a daily bulletin on the prices and stocks of cotton in the chief Indian and Foreign markets while a weekly bulletin of conditions in its markets was issued by the South Arcot Market Committee. The Guntur Market Committee continued its publications of 'Pogakulokam'. The day-to-day arrivals, disposal and prices in all the markets of Committee were published in each of the markets in South Arcot district for the benefit of growers. These data from South Arcot as also from South Kanara and Malabar were got published in the dailies also. Prices of milch cattle at Tiruvottiyur and prices of vegetables and eggs were furnished to the Director of Statistics, Madras. A monthly review of market conditions, a special report on the decontrol of foodgrains and its after effects and a bi-monthly review on cotton situation were submitted to Government. A monthly review of stocks, and prices of tobacco was furnished to the Indian Central Tobacco Committee for incorporation in the bulletin issued by it. Details of stocks, production, prices and exports of different agricultural commodities received from the Market Committees as also those gathered in the section were maintained, tabulated commodity wise for use against any enquiry or in survey reports.

Co-operative marketing.—The marketing staff at headquarters and at regional centres contacted a few important co-operative societies and rendered positive help in better marketing of Agricultural produce.

Market legislation.—The Forward Contracts (Regulations) Act, 1952, of the Government of India came into force in August 1953. The Madras Commercial Crops Market Act and Rules had a few amendments.

The levy system of paddy procurement was continued in the surplus districts of Tanjore and Circars under the Paddy Levy Procurement Order to build up the buffer stocks of the State.

Warehousing and storage.—Efforts were made to convert some of the existing godowns of the co-operative societies into licensed ware-houses

under the Madras Warehouse Act which came into force from 1st May 1953 though no progress was achieved.

Work done on behalf of the heads of departments and other States.—Data on various subjects relating to production, supply, movement, prices and other economic aspects were supplied to the heads of a few departments in the State and to other States. This work formed one of the many important functions of the marketing section. Samples of rice and paddy were analysed, on behalf of the Board of Revenue (Civil Supplies) and opinion as to the quantity was offered. Data on export of chillies to Bihar and Bengal from Madras State during 1952 as also remarks on the sharp increase in prices of onions and chillies were submitted to the Board of Revenue (Civil Supplies). Information regarding area and production under Chewing and Cigar varieties of tobacco in Madras State for the year 1949–50 to 1951–52 were furnished to the Secretary, Indian Central Tobacco Committee. Information regarding the production in Madras State of different varieties of cotton seeds and percentage of oil in respect of each variety was also furnished to the Director, Alagappa Chettiar College of Technology Karaikudi. Information regarding the addresses of food canning industries in Madras State was furnished to the Board of Revenue (Civil Supplies).

Transport.—Speedy transport facilities over railways were arranged whenever sought for by parties for the movements of agricultural commodities.

Review of prices and market conditions.—The year began with an all-round gradual fall in the prices of all commodities. The course in prices of important commodities during this period is briefly given below :—

(*a*) *Rice.*—At the commencement of the period under report in July 1953 the prices of paddy and rice ruled fairly high at Rs. 16 to 18 and Rs. 25 to 30 per Indian maund respectively in the different markets in the State. These rates were more or less steady till September 1953 when a flutter was experienced as a result of the scramble for imports from Andhra for stock piling for fear that movement restrictions might be imposed after the partition of the State from 1st October 1953. But these fears were soon allayed with the announcement of the Government of India that the partition will not disturb the arrangements for the distribution of foodgrains in the concerned States. Consequently the prices began declining steadily and the closing rates for standard maund on 30th September 1953 stood at Rs. 14 to 15 for paddy and Rs. 22–8–0 and Rs. 25 for rice.

(*b*) *Millets.*—The fall in prices of millets was more marked than in other foodgrains. The reason ascribed is the ample rainfall and good seasonal conditions during the year, that brought larger areas under millets followed by better yields. The prices of ragi, cumbu and cholam per standard maund opened high in July 1953 at Rs. 18 to 20, Rs. 17 to 20 and Rs. 19 to 20 respectively. As a result of the steady declining trend the lowest quotations of Rs. 12–12–0, Rs. 13–14–0 and Rs. 13–8–0 per maund for ragi, cumbu and cholam respectively were recorded towards the end of the period under report.

(c) *Pulses.*—Satisfactory local production and large imports from Madhya Pradesh, Bombay, Hyderabad and Bengal where bumper harvests were reported contributed largely to the lowering of the prices of all the

ılse varieties in State. The opening and closing rates of pulses in the ate during their period are given below ;—

Rates per maund of 82-2/7 lb.

	Opening rate in July 1953.	Closing rates (minimum).
	RS. A.	RS. A.
Bengalgram	23 0	19 0
Redgram	18 15	14 0
Blackgram	25 1	16 4
Greengram	20 13	15 8

Plenty of stocks were available to meet the consumer's demand in the ;ate.

(*d*) *Oilseeds.*—The prices of groundnut kernels ruled high at Rs. 230 to s. 280 per candy of 531 lb. at the commencement of the year in the impor- nt markets in South Arcot, Coimbatore, North Arcot, Bellary and nantapur districts and in Madras City. The prices began shrinking in ugust 1953 and reached Rs. 220 to Rs. 270 according to quality and in eptember the prices started a downward fluctuation to settle down at s. 155 to Rs. 170 at he close of the month.

(*e*) *Arecanuts.*—The markets for arecanuts in Malabar and South anara ruled dull in July and August 1953 when the price levels stood at s. 136 for choor and Rs. 116 for Aylan varieties. The prices improved eadily during September and closed with peak levels at Rs. 144 and s. 132 per bag of 100 lb. for the two classes.

(*f*) *Cane jaggery.*—Cane jaggery markets opened at Rs. 24 to Rs. 28 per ndian maund in July 1953 and gradually declined in the following months nd stood at Rs. 20 to Rs. 22 per maund at the closing period of September 953.

(*g*) *Tamarind.*—The prices of tamarind increased abnormally in 1952 ue to heavy demand and low stocks. The price which opened at ts. 22–9–0 to Rs. 34–9–0 in July 1953 closed at Rs. 27–13–0 to Rs. 37–13–0.

(*h*) *Cotton.*—The price of cotton revealed declining trend in most of the mportant markets for the different varieties during the period. There was, owever, a slight gain in the rates for Tinnies. The opening and closing ates for the different varieties during the period under report were as given elow ;—

Prices per Indian maund of 82-2/7 lb. in rupees and annas.

Name of the market. (1)	Varieties. (2)	Opening July (first week). (3)	Closing September (last week). (4)
		RS. A.	RS. A.
Guntur	Cocanada	62 15	58 12
Adoni	W. Northern ..	76 12	76 3
Do.	R. Northern ..	75 12	73 5
Do.	Mungari	58 10	58 10
Tiruppur	Cambodia	96 3	93 3
Do.	Karunganni	87 12	83 14
Do.	Tinnavellis	81 0	83 5

(*i*) *Tobacco.*—The prices of tabacco fluctuated within narrow limits during the period in the Southern Districts for the chewing and cheroot varieties

while there was a steep decline in the rates for cigarette tobacco of the circars. The opening and closing prices at different centres for different varieties were as follows :—

Prices in rupees, and annas per maund of 82-2/7 *lb.*

	Opening.	Closing.
	RS. A.	RS. A.
Guntur flue cured	132 12	90 9
Guntur rack cured	55 9	26 12
Coimbatore chewing	161 10	161 10
Coimbatore pit cured	36 9	55 6
Erode air cured	39 6	39 0

(*j*) *Pepper.*—During the period under report the prices of pepper showed large oscillations between Rs. 2,500 to Rs. 2,800 per candy of 700 lb. with a steady decline from phenomenal levels obtaining previously. The decline was ascribed to the unsteady nature of demand by American importers and was also influenced by the lower rates offered by Indonesian and Sarawak shippers.

On the whole it may be stated that prices of all agricultural commodities registered a steady fall due to the better internal and international production prospects and cessation of hostilities in Korea.

XVII. LEGISLATION AND STATISTICS.

(1) *Weekly cotton-mill and press returns.*—In accordance with section 5 of the Cotton Ginning and Pressing Factories Act, 1925, the ginning and pressing factories in the State have been submitting weekly returns in the prescribed forms. The weekly statistics are compiled and published in the *Fort St. George Gazette.* Copies of these weekly statements are also being sent to the Economic Adviser, Government of India, New Delhi, Indian Central Cotton Committee, Bombay and Secretary, East Indian Cotton Association, Limited, Bombay.

(2) *Cotton Transport Act—Annual general licence.*—No licences were issued during the period under report.

Single licence by sea.—During the period 24 licences were issued for the transport of 6,875 bales of 392 lb. each of ginned cotton for the purpose of spinning.

Single licence by road.—Nine licences were issued for the transport of 298,293 lb. of ginned cotton and 14 licences for the transport of 80,900 lb. of cotton waste and mill sweepings into the protected areas.

Single licence by rail.—Six licences were issued during the year for the import of 119,400 lb. of ginned cotton, one licence for the import of 170 lb. of unginned cotton, 29 licences for the import of 675,900 lb. of cotton waste and one licence for import of cotton seed into the protected areas notified under the Cotton Transport Act.

(3) *The Cotton Control Act.*—The Act was enacted to be in force in the State and rules under the action are being formulated.

(4) *Cotton Certification Order.*—With the object of getting exemption from price control for the superior cottons grown in the State, Cotton Certification Schemes were sanctioned in 1950–51 and continued in 1951–1952 and 52–53.

The Madras Sugar Factories Control Act, 1949.—The Madras Sugar Factories Control Act, 1949, as amended by Act IX of 1952, was applied during the period, 1st July to 30th September 1953, 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 continued to function as Sugarcane Commissioner under the Act. Of the 15 licensed factories, only 14 sugar factories worked during the crushing season ending June 1953, out of which three factories worked for a very short time.

Sugarcane Advisory Committee.—There was one meeting of the Sugarcane Advisory Committee, on 16th September 1953 to consider the following matters :—

(*a*) Review of the working of the Madras Sugarcane Factories Control Act, 1949.

(*b*) Installation of formatic automatic weigh bridges in all sugar factories.

(*c*) Revision of agreement form.

(*d*) Rejection of canes under certain circumstances.

(*e*) Devise measures for preventing stealthy purchase of cane at a lower rate and supply to the factory.

(*f*) Weighment of canes at the factory—time limit for unloading canes from carts.

The proceedings of the meeting with the remarks of the Director of Agriculture were communicated to Government.

Special staff.—Three upper subordinates, at one each for the Superintendents of three Sugarcane Liaison Farms at Kulitalai, Nellikuppam and Samalkota, continued to assist the Superintendents of the farms in the day-to-day enforcement of the Madras Sugar Factories Control Act, 1949. One Sugarcane Inspector at Visakhapatnam also continued for the same purpose with one lower division clerk and a peon. At the headquarters, the special staff of one Cane Development Officer, one upper division clerk, one typist and one peon continued till 30th September 1953.

Price fixation of sugarcane during 1953-54.—The Government of India notified under the Sugar and Gur Control Order, 1950, that the minimum price payable by sugar factories on cane purchased by them for crushing, shall be Re. 1-5-0 per maund for rail-delivery, and Re. 1-7-0 per maund for gate-delivery. These rates were made applicable to the factories in Madras State and Government ordered that the system of paying cane price according to the SISMA formula might be left to be worked voluntarily between the cane suppliers and the sugar factories.

XVIII. SOIL CONSERVATION.

Soil Conservation Schemes were in progress in Rayalaseema (Bellary, Anantapur and Chittoor), Coimbatore and Nilgiris districts, as already detailed under the Five-year Plan schemes.

(*a*) *Soil conservation demonstration centre at PALADA.*—To serve as a typical soil conservation demonstration centre in the Ootacamund taluk of

Nilgiris district, it was considered necessary that soil conservation schemes should be executed in a compact area comprising a self defined catchment or sub-catchment in a suitable place representative of the taluk. The State Soil Conservation Board during its 7th meeting held at the Ootacamund Collectorate on 14th May 1953 endorsed the above view and recommended that similar soil conservation demonstration centres should be set up in Kotagiri sub-circle and Gudalur taluk as well. Accordingly a self defined sub-catchment comprising an area of 300 acres was selected in Palada village and the site was also approved by the Nilgiris Soil Conservation Board. Detailed survey work was also carried out over about 150 acres pending final approval of the scheme by the Government.

(*b*) *Agricultural Research Station, Satyamangalam.*—The Assistant Agricultural Engineer, Soil Conservation Scheme, Dharapuram, inspected the contour bunding work executed at the Agricultural Research Station, Satyamangalam and offered suggestions for the provision of principle outlets at every crossing of the irrigation bothie etc.

Training of Revenue Inspectors and village officers.—The training of Revenue Department officials (Revenue Inspectors and village officers) of the Nilgiris district was continued. All the subordinates deputed for training completed their theoretical and practical training in soil conservation technique and were thus equipped with the requisite knowledge, to do propaganda on soil conservation in the Nilgiris district.

XIX. AGRICULTURAL ENGINEERING.

The Agricultural Engineering Branch was engaged in arranging supply of suitable Agricultural implements, oil engine and electric motor pump sets for irrigation and mechanical cultivation units as tractor with matched implements and bull dozers. There was great demand for power machinery for cultivation and irrigation purposes.

(1) *Tractors and land reclamation.*—Reclamation of cultivable waste lands both virgin and old fallows and the adoption of mechanical cultivation methods have been recognised by the agriculturists as an important means of extending the areas under agricultural production. Cultivation of land with power operated units and particularly with the assistance of tractors and allied integrated and matched implements is one of the important items planned under the accelerated National Food Production Programme for achieving self-sufficiency and to raise the overall level of crop yields.

Departmental tractors are now regularly used for ploughing, harrowing and also for trampling green manure, into puddled wet lands with rotavator attachment. The advantages of rotavating are being more fully realised by agriculturists who have actually used them on their lands. A perfect puddle is obtained by working the rotavator. It has also proved as an useful method of incorporating green manure into the soil to accelerate decomposition. From the districts in which they had worked during the previous years, there have been increased demands for the supply of the rotavator for ploughing-in standing crops of green manures and puddling, as this is found to be not only very efficient but also very economical. There has been similarly increasing demand for the same from the sugarcane growing areas of South Arcot.

Bull-dozers are used in an increasing measure for the levelling and bunding of eroded fields and also for the reclamation of waste lands and clearance of virgin areas. The same units are now usefully employed for the restoration of sandcast areas affected by floods and the systematic excavation of badly silted up tanks. Silt removal in tanks and spring channel excavation are also normal uses to which those labour saving power equipments are employed. Agriculturists have become more alive to the fact that their reclamation operations with tractors can be performed more efficiently and with a saving in costs and whenever such operations are to be done they go in for these modern machinery hired out by the Agricultural Engineering Branch.

Now that much importance is attached to the problem of soil conservation by the agriculturists, there is popular demand for bull-dozers in the hilly tracts of the Nilgiris for purposes of bench terracing on contours and for ploughing and other tillage operations. The work carried at Nanjanad, over the area selected for effecting soil conservation measures with the help of the caterpillar bull-dozers has become very spectacular for the whole district. As a result of this mechanical contour terracing and trenching done in an excellent manner combining both speed and economy, many of the other land owners in the adjoining areas have since requested for the supply of bull-dozers for having their area. similarly contour trenched and bench terraced to arrest soil erosion and conserve moisture to the maximum extent. Two of the bull-dozers in the Nilgiris district have already been moved for this purpose and are still working on individual estates to the full satisfaction of the owners of the lands. Some more machinery are being moved to this work for tackling the increasing needs of ryots.

Nearly 666 tractors of various types are stated to be in the State as detailed below :—

Government Agricultural Department	302 *
Private parties	276
Other than Agricultural Department	62
Co-operative Societies	26
Total ..	666

(* Details are given in Appendix.)

A statement showing the acreages tackled by the departmental tractors from the years 1946–47 to 1953–54 (for 3 months alone) is furnished in the Appendix.

Out of the total outturn of 10,545 acres for 1953–54, 1,695 acres have been newly reclaimed from the virgin areas and the rest are old abandoned fallows, that were left uncultivated for several seasons and not easily capable of cultivation by animal power. The demand for tractors and bull dozers has been steady in all the districts. This can however be increased if loan facilities are made available to the ryots for hiring of tractors. As the payment of hire charges in cash and fully as advance payments is strictly enforced, ryots who own small holdings find it very difficult to pay the full hire charges in advance as they do not have ready fluid cash at all times.

The particulars of receipts to the department on account of hire charges on tractors and bull-dozers from the year 1946–47 are furnished

below. This statement shows that there has been a progressive increase in the receipts from year to year :—

Year.	Receipts.
	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
1953–54	3,21,335 (for July and August 1953).

(*b*) *Tungabhadra Project.*—The departmental tractors and bull-dozers were engaged in the clearance of the selected forest areas and the subsequent levelling, poughing, bounding and other operation for the rehabilitation of the persons displaced by the project works. The operations were completed as scheduled originally and the tractors were withdrawn at the end of September 1953 and returned to the respective areas.

The Pilot Scheme sanctioned for mechanized reclamation and terracing and converting the dry tracts suitably for wet cultivation with tractor unit in the Kampli and Bellary areas was continued during the year. The works over the entire area of about 6,000 acres were completed and the departmental units were withdrawn from these works at the end of September 1953.

(*c*) *Sugarcane Development Scheme* (*Engineering*).—The four units intended for the improvements of sugarcane cultivation continued to work in the districts of Bellary, South Arcot, North Arcot and Visakhapatnam. The figures of out turn of the tractors in the districts which are now in Andhra State are not available. The outturn of the tractors in the districts of North Arcot and South Arcot are furnished below :—

	ACS.
Total area ploughed	106½
Total area harrowed	60
Total area ridged	Nil.
Total area of dry ploughing done in paddy fields.	66·88
Number of ryots benefited by the use of tractors.	27

The deep ploughing is directly beneficial to the sugarcane grower has been more than amply illustrated by the fact that most of the prize winners in the South Arcot District Sugarcane Yield Competition had their fields deep ploughed with the departmental units and the ridging and furrowing for planting were also executed by the riding outfits operated by tractors. There has also been a steady increase in the demand for tractors in the factory area of South Arcot district for ploughing and ridging sugarcane fields and with the more favourable seasonal factor and better rainfall during the year, this has registered a very much steeper rise than usual. To satisfy this increase the available units in the adjoining districts are pooled together and worked on the group system.

(*d*) *Supply of tractors under hire-purchase system.*—The scheme for supply of tractors under hire purchase system continued this year also. This scheme is gaining appreciable popularity among the more enterprising and progressive agriculturists who are keen to have their own tractors according to their own choice but are unable to purchase for cash. During the period under report 13 tractors (particulars are given in appendix) were supplied under this scheme and they are all being put to very good use by the ryots for various field and haulage operations. While during the cultivation seasons, the machinery are put to intensive use on the fields for tillage, they are employed to advantage for haulage of produce and agricultural transport as a regular feature and on a profitable basis by all the owners.

(*e*) *Tractor workshops.*—There was three tractor workshops functioning in the State one at Coimbatore, one at Bapatla and another at Bellary. These workshops were engaged in the periodical servicing, overhauling and repairing of tractors and bull dozers and attached accessories, departmental vehicles and agricultural implements. Old and wornout spare parts received from various districts were reconditioned and wherever feasible rebuilt by welding new material and supplied to the districts.

In the workshop at Coimbatore, one additional bench grinder was installed during the period under report. With the perfection of the low temperature alloy, welding process using special metal for electric welding, the rebuilding of many of the wornout parts by adding new metal to the old surfaces has been made applicable to a wider and more varied sphere than during the previous years. It is now found that the single electrical welding equipment is not able to handle all the different jobs coming in from the districts and the need for another such welding repair kit is now keenly felt by the workshops at Bapatla and Coimbatore which manage the main bulk of these repairs.

(*f*) *Training for oil engine and tractor drivers.*—Government in their Order No. 477, Food and Agriculture, dated 30th March 1953, sanctioned the continuance of the training to tractor and oil engine drivers with a view to provide necessary trained personnel of the right type. Training was given to 16 departmental and 8 non-departmental candidates in the tractor workshops, Coimbatore and Bapatla. The training commenced in August 1953 and ended in December 1953 and covered all the practical aspects relating to the maintenance and handling of the various kinds of light and heavy machinery in the departments including oil engines, pumpsets, tractors and bull dozers.

(*g*) *Assistant Agricultural Engineers.*—A statement showing the jurisdiction of the Assistant Agricultural Engineer is shown in the appendix.

The Assistant Agricultural Engineers in the various regions carried out detailed checks and inspections over the various operations, maintenance and outturn of individual machine. Prompt attention was paid to put into commission machinery which needed repair or renewal of parts by attending to them mostly in the fields themselves. The need for well equipped mobile workshops in the districts for attending to repairs to engines, tractors and other farm machinery is being increasingly felt in all parts of the State.

(*h*) *Oil-engine pumpsets for hire.*—During the period under report the scheme for land development by mechanical power lift irrigation by hiring of oil-engine pumpsets was continued throughout the State. The department had on hand 767 oil-engine pumpsets of the portable type for hiring to the ryots before the separation of the Andhra State. 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. As the demand was on the increase in Madurai district on account of the failure of seasonal rains and normal irrigation sources, some units were diverted from other districts to that district and they were returned back to their original places as soon as the emergency demands from the affected areas were met and the requirements returned to normal. No new units were purchased during the period under review. On the separation of the Province, the units kept in each district were continued to be kept there so that the ryot's requirements in them may be met as before. The question of dividing the assets and liabilities is under consideration of Government on the basis of the formula prescribed for this purpose in respect of capital investments.

(*i*) *Oil engine and electric motor pumpsets on hire-purchase system.*—The scheme for the supply of oil engines and electric motor pumpsets under the hire-purchase system continued to operate during the period 1st July to 30th September 1953 in the composite State, and after partition, in the residuary Madras State as well. It was only during these three months on the eve of the separation of the Andhra State, several policy changes in the matter of supply, were effected and the loan of the Government of India sanctioned in G.O. Ms. No. 8, Food Production, dated 6th January 1953, had to be redistributed again between Andhra, Mysore and residuary States based on the number of units acquired from the inception of the scheme. Again during this period Government directed that the purchase of indigenous types of oil engines and pumsets on tender system hitherto followed should be dispensed with and purchases should be made only as per rate contracts entered into by the Director-General of Supplies and Disposals, New Delhi. It was also ordered that no bulk purchase should be made in anticipation of demands from the ryots and the purchase should be made as and when the applicants produce the necessary documents in complete shape individually.

2. While the above directions were being examined, orders of Government in Memorandum No. 2216-F. IV/52, dated 1st July 1953, were received to the effect that no loan amount sanctioned by the Government of India for 1952-53 should be spent after 30th June 1953. In the meanwhile the attention of the department was mainly engaged on the redistribution of loan of Rs. 25·58 lakhs left over from 1952-53 for utilization during 1953–54. A sum of Rs. 7·28 lakhs had to be deducted being the expenditure already incurred up to 30th September 1953 for the composite State and the balance of Rs. 18·30 lakhs had to be allocated afresh between Andhra, Mysore and residuary States. Out of this, the share of residuary State was Rs. 13·25 lakhs being the unspent balance for 1952–53 and this amount has been reallotted by Government in G.O. Ms. No. 13 Food Production, dated 21st January 1954, and No. 71 Food Production, dated, 10th March 1954 for distribution of 271 oil-engine pumpsets and 171 electric motor units. Besides this, Government have also allotted a sum of Rs. 13·18 lakhs being the provision for 1953–54 allotment for the residuary State for a target of 326 oil engines and 140 electric motors. The finally accepted rate contract lists were received only in March 1954 and regular supply of sets started from July 1954 onwards. Up to the end of September 1953, the targets fixed yearwar and sets distributed to the ryots under hire-purchase system are furnished below :—

Composite State.

	Targets sanctioned.		Units acquired.	
	Oil Engine.	Electric motors.	Oil Engine.	Electric motors.
1949–50 commenced only from October.	1,000	300	83	6
1950–51	1,250	200	1,233	191
1951-52.	625	189	541	158
1952–53	775	365	6	53
Total number supplied ..	..	..	1,863	408

3. The actual expenditure incurred for the purchase and distribution of pumpsets and receipts by way of collection of instalments from 1st July to 30th September 1953 are given below :—

	Rs.	A.	P.
Expenditure	46,242	9	0
Receipts	1,27,269	14	0

(*j*) *Filter-point tube wells scheme.*—The scheme for the sinking of 600 filter-point tube wells in the selected areas in the composite State sanctioned for 1952–53 was started on 1st April 1953 and completed to the extent feasible on 30th June 1953 as the original date of sanction accorded by the Government of India for achieving the targets laid under the scheme expired on that date. On receipt of fresh orders of Government extending the duration of the scheme up to 30th September 1953 the work on the granting of loans was resumed and the entire sum of rupees fifteen lakhs sanctioned was completely spent by 30th September 1953. Pumpsets were fitted up to 595 filter points. A fresh scheme on the same lines for sinking another 750 filter points for the entire composite State in 1953–54 was sent to Government. The area benefited with irrigation water-supplies by these filter-point tube wells was estimated at 5,950 acres and the additional yield expected was 2,975 tons. The scheme was found beneficial to ryots for raising short food crops in summer and in bringing new lands under irrigation; and the demand for such filter points is increasing in the districts, particularly in East Godavari, Guntur, Nellore, North Arcot, Chingleput, Tanjore, Tiruchirappalli, Madurai and Ramanathapuram.

(*k*) *River pumping scheme.*—The special staff sanctioned for the implementation of the river pumping scheme on a large scale was not appointed and hence appreciably steady progress of work in this direction could not be achieved. The River Pumping Schemes at Pinayur and Nelvoy in Chingleput district were continued. Preliminary arrangements were made for starting River Pumping Schemes at Lakkidi-Pallapuram in Walluvanad taluk in the Malabar district in an area of 167 acres and 113 acres, respectively, under these schemes.

A new river pumping scheme was started on 1st July 1953 at Kilithur village, Kumbakonam taluk, Tanjore district, on the banks of the Pazhavar river which is a drainage channel. Supply of irrigation water was made for raising the early nurseries of Kuruvai. The total acreage for which water was supplied was about 45 acres. A water charge of Rs. 3-8-0 per irrigation per acre was charged. Takkavi loans amounting Rs. 2,840 were issued to 21 ryots and against this amount three bags of paddy seeds of improved strains and 99 bags of groundnut cake were supplied. As a result of this scheme, there was an increase in the area of Kuruvai by 28·21 acres which gave an additional yield of paddy by nearly 26 tons and the increased yield due to the early raising of nurseries on 30·08 acres was estimated at over 8 tons. The grand total of additional yield on account of the facility given by the scheme was about 34 tons. The pumping operations on the scheme were stopped as water was let into the channels and as there was then no need to pump out water for irrigating these fields commanded by the sets.

(*l*) *Pipes.*—Due to the sudden decontrol of pipes by the Government of India there was a great glut in the market and slump in the local prices and pipes were readily available in the open markets in large quantities. Hence the acquisition of pipes afresh by the department to meet the demands of the ryots was stopped altogether and steps were taken to dispose off the stock on hand. Proposals were sent to Government to relax all rules imposed on sales of pipes and to sell freely to all without any limit in the quantity to be sold. The Government passed orders that pipes held in the department might be sold to all at the prevailing market rate, after meeting the requirements of the Government Departments so that the loss on account of the slump in prices may be minimised. The several heads of departments were also informed by Government to take their full requirements of pipes from the stocks held by the Agriculture Department and regularize the transaction as envisaged in Government Memorandum No. 96761, P.W.R. (Finance), dated 5th January 1953. Steps were also taken to dispose of the stocks as per instructions of Government. The quantity of pipes held in the department on the separation of the Province on 1st October 1953 was 538,410 feet.

(*m*) *M.B. sheds.*—All the M.B. sheds constructed by this department for storage accommodation for seeds, manures and other agricultural implements at the various selected centres were in regular use for storage purposes and for accommodating plant and machinery held by the department. Proposals were formulated for electrifying certain M.B. sheds so as to provide some minor workshop facilities for the departmental machinery as such centres to render greater service to agriculturists since there were not many private workshops in those districts.

(*n*) *Lorries und jeeps.*—The number of motor vehicles under the control of this department during the period under report was as follows :—

Lorries	41
Jeeps	47
Buses	6
Station wagons	3
Jeep trailers	15

(*o*) *Iron and steel.*—The departmental activities which originally started with State trading in iron and steel are now confined to placing quarterly indents for iron and steel for agricultural purposes in consultation with the State Steel Advisory Board.

The acquisition and distribution of iron and steel under the State agricultural quota were being done with the association of the co-operative societies in this State from the middle of 1950 up to the third quarter of 1953.

In the third quarter of 1953, Government ordered that the retail distribution of the iron and steel for agricultural purposes be taken away from the co-operative societies and entrusted to the registered stockholders of this State, who should distribute the stocks in accordance with the prices fixed by the Iron and Steel Controller, Calcutta. This system is now in vogue.

An *ad hoc* allotment of scrap iron and defectives is being made every quarter for allotment to the fabricators of this department *through* the two departmentally controlled stockists at Madras and Tuticorin for manufacture of suitable agricultural implements. A quantity of T. 208-12-3-12 of defectives was received and allotted to the fabricators of this Department during the period for manufacture of agricultural implements and other suitable accessories.

(*p*) *Agricultural implements.*—A conferenee 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 and Machinery were discussed and several recommendations were made. Steps have been taken to implement these recommendations, and to commence the scheme sanctioned.

As a result of the decisions arrived at during the above conference, it is proposed—

(i) 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 sanction of Government has also been accorded to conduct the survey.

(ii) To appoint an advisory committee consisting of representatives of cultivators, makers of agricultural implements, co-operative organisations and departmental officers on the reserch 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 the notice of the manufacturing firms and implements that are in popular demand and require to be manufactured. This committee is also required to arrange for tests of improved agricultural implements in conjunction with the Agricultural department whenever 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 in this regard.

(iii) To get agricultural implements on consignment basis from recognized organized manufacturers like Messrs. P.S.G. & Sons Charity Industrial Institute, Cooper Engineering Limited., Kirloskar Brothers, and others and supply them to ryots, through multi-purpose co-operative societies.

(iv) To draw up two schemes for intensive demonstration—(i) for the general district level to be carried out by the Agricultural Demonstrators under the District Agricultural Officers and (ii) on a more elaborate scale in consultation with the Project Executive Officers in Community Project Centres. Final orders of Government for drawing up the schemes are awaited.

(v) 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 Government on the request of the Indian Council of Agricultural Research.

It is also proposed to purchase and experiment with power rotary harrows, rotary cultivators and screw type power tillers from Japan, conduct trials and examine their utility for local conditions. Government have called for the financial implications in this regard and the firms in Japan have been addressed for particulars pertaining to cost, etc.

XX. SPECIAL PROBLEMS, PROGRAMME AND WORK DONE IN THE DISTRICTS.

Srikakulam.—Good progress was made in the modified Japanese system of paddy cultivation; over 1,797 acres were covered with over 905 demonstration plots. The district had over 475 bee-hives in working conditions. Agricultural improvement work was pursued in the Agency areas.

Visakhapatnam.—Intensive propaganda for modified Japanese method of paddy cultivation was carried on. Over 217 agricultural associations were formed. Over 70 acres of brinjal fields were sprayed with Guesarol 550 for control of Epilachna beetle attacking the crop.

East Godavari.—Bee-keeping was intensively pursued with the employment of 8 special demonstration maistris and about 1,250 bee-hives were maintained. About 15,500 acres were brought under the Modified Japanese method of paddy cultivation. The district suffered mos; from Godavari floods and efforts were made to help ryots with seeds, manures, implements, etc., to restart cultivation wherever necessary.

West Godavari.—Due to intense propaganda rural and urban composts have come to be largely used. This district also was affected by the Godavari floods. The propaganda staff made strenuous effect to help the cultivators with seeds, manures and implements and loans were also liberally granted. Agricultural associations were formed for almost all the villages in the district.

Krishna.—P. 216-F cotton introduced in the rice fallows of the district did not fare well nor was it found as paying as groundnut which has already come into cultivation in the rice fallows during the past decade. Cabbage and cauliflowers have been found to do well as vegetables in the district.

Guntur.—Japanese modified method of paddy cultivation was intensely pursued with 350 demonstration plots laid in the important paddy-growing taluks. Agricultural associations were formed in about 78 per cent of the villages in the district. Over 16 lakhs of rupees were issued as loans under the intense manuring scheme.

Nellore.—Over 582 tons of improved paddy seeds, especially those resistant to blast were distributed, sufficient to cover an area of 40,800 acres in the district.

Bellary.—About 336 acres of waste lands were brought under cultivation through tractors and 200 acres were levelled by bull-dozers. A special scheme for contour-bunding for conservation of soil and rain water, was being worked in the district. Saline soils in Harpanahalli taluk were under reclamation through the use of lime and sulphur.

Kurnool.—Over 63 tons of improved millet seeds to cover 20,000 acres and 32 tons of improved cotton seeds to cover 7,130 acres were distributed. Demonstration and propaganda was carried on for bunding with bund-formers on a large scale as a measure of soil and water conservation. Laxmi cotton an improved American cotton strain from Bombay, has come to occupy large areas in the district.

Anantapur.—Modified Japanese method of paddy cultivation was intensely advocated. Reclamation of alkaline lands, use of tractors and bull-dozers in reclaiming virgin lands, pest control work in chilli gardens received the attention of the extension staff.

Cuddapah.—About 645 tons of sulphate of ammonium and 61 tons of super phosphate were distributed to ryots. Modified Japanese method of paddy cultivation was advocated through the Agricultural Associations formed in the district. Over 134 tons of improved seeds were distributed. S.R. 26 B, a variety resistant to saline conditions of soil was successfully grown for demonstration in the saline lands of the district.

Chittoor.—About 709 acres were ploughed with tractors and 100 acres levelled by bull dozers. About 5,610 fruit plants and 102 lb. of vegetable seeds were distributed. Besides extension work on cultural, manurial, irrigation and plant protection aspects in mango, oranges and lime gardens over 19 acres was attended.

North Arcot.—Mechanical cultivation with tractors and bull-dozer have become popular and cultivators have become greatly enlightened in respect of converting farm waste into composts and control of pests and diseases. Modified Japanese method of paddy cultivation was demonstrated in over 250 plots and an area of 600 acres were covered.

South Arcot.—Modified Japanese method of paddy cultivation was popularized over 398 acres. An intense drive for green manuring and sinking of filter point tube-wells was given. About 427 acres of green manures were grown and tube-wells were sunk in all taluks.

Chingleput.—Sixty-two tube wells as against a target of 60 were sunk. A total quantity of 186·23 tons of seeds of improved strains were distributed to cover 8,370 acres. In the City over 452 lb. of vegetable seeds and 10,800 seedlings were sold to the public.

Salem.—Green manure campaign to plant Sesbania along paddy field bunds was intensified and 8,008 acres paddy area was covered. Intense propaganda was done for mixed cropping of ragi and groundnut with P. 216-F. cotton in dry lands where there is wide scope for the practice.

Coimbatore.—Soil conservation measures were taken up and 955 acres were contour-bunded, 435 acres were cultivated along contours, 82 acres were terraced. Five hundred and eighty-two acres were levelled and 581 acres were bunded with the bund-former; green manuring campaign was intensified and 1,125 acres were planted with Sesbania and 32,112 acres with Gliricidia.

Tiruchirappalli.—About 850 acres were reclaimed with the aid of tractors. Seventy filter point tube-wells were sunk against a target of 50 fixed. About 100 tons of improved paddy seeds were distributed to cover 6,026 acres of paddy land. Agricultural Associations were formed in almost all the villages in the district.

Tanjore.—Japanese modified method of paddy cultivation was brought into practice over 1,216 acres. In 23,862 acres of Kuruvai area and 53,069 acres of samba areas—Sesbania seedlings were planted for green

anure purposes. About 7 tons of Sesbania seeds were distributed. Over
man36 tons of paddy seeds to cover 3,905 acres of paddy area were distributed.
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Pattukottai.—Two hundred and fifty-two tons of improved paddy seeds were distributed. Over 5 tons of Sesbania seeds were distributed and 12,685 acres were covered.

Madurai.—One hundred and fifty-two tons of improved paddy seeds were distributed to cover 7,600 acres. About 450 acres were grown with green manures. Over 621 demonstration plots were laid in the Japanese method of paddy cultivation.

Ramanathapuram.—About 210 acres were ploughed with tractors and there is great scope for reclamation of waste lands in the district. Filter point tube well scheme benefitted Paramakudi and Sivaganga taluks. Propaganda for adoption of Japanese method of paddy cultivation was intensively done,

Tirunelveli.—Sesbania seedlings were planted in 6,102 acres of paddy land. About 24 tons of improved paddy seeds were distributed to cover 1,073 acres. Campaign for the modified Janpanese method of paddy cultivation was intensified.

North Malabar,—About 24 tons of paddy seeds to cover 682 acres were distributed. Efforts were made to increase the area under sweet potato and tapioca and about 25,000 vines in the former and 2,500 stem cuttings in the latter were distributed. Eighty-two pounds of vegetable seeds were distributed.

South Kanara.—Nineteen tons of improved paddy seeds were distributed to cover 870 acres. About 142 acres were brought under fodder grasses. Modified Japanese method of paddy cultivation and raising Sesbania along bunds were popularised.

Nilgiris.—Soil conservation measures were put into effect and 310 acres were terraced, 100 acres were contour-bunded and planted with economic trees and 310 acres were grown with grasses. Contour cultivation was introduced over 100 acres.

A special scheme for the welfare of the Todas was in operation with expanded staff. Ninety bags of seed potatoes for irrigated crop, 494 bags for the main crop with an equal quantity of manure mixtures were distributed. Compost to the tune of 200 tons was got prepared and 100,000 vegetable seedlings were distributed.

XXI. FINANCE.

The following are the expenditure and receipts in Agricultural Department up to 30th September 1953.

		RS. IN LAKHS.
1	Expenditure—40. Agriculture	115·0
2	Receipts—XXIX. Agriculture	71·0

XXII. SALIENT FEATURES OF WORK DONE AND OUTSTANDING ACHIEVEMENTS DURING THE YEAR 1953-54 UP TO 30TH SEPTEMBER 1953.

Season.—After a succession of six years' deficit rainfall, the year under report experienced good seasonal rains and crops were found to be normal and even above normal in certain districts.

Intensive cultivation schemes (Five-year Plan).—During the third year operation of the intensive cultivation scheme under the First Five-year National Plan, all the agricultural schemes have been in operation and have contributed to additional production of foodgrains. Besides the plant protection scheme helped to save foodgrains and other crops from loss due to pests and diseases. Five hundred and ninty-five filter points were installed and fitted with pumpsets.

Cotton Extension Plan.—As against a targeted area of 108,000 acres and production of 77,385 bales (392 lb. each) the achievements during the period under report are 17,954 acres and 6,214 bales.

Research.—The Agricultural Chemistry section analysed 583 samples of plant materials, manures, foods and feeding stuffs, wastes, etc., and co-ordinated in the research on Manurial and Soil Survey, agronomic studies on rice and storage of fertilisers sponsored by the Indian Council of Agricultural Research on an All-India basis.

In the Agricultural Entomology Section, Parathion sprays at 0·025 per cent strength were found to be effective against spotted bollworm of cotton. Timely fumigation with calcium cyanide and dusting bags externally with Lindane dust at periodic intervals was found to keep off infestation of stored dry ginger, by store-product pest Lasioderma.

In the Agricultural Mycology Section, root rot disease of Papaya was found to be controlled by drenching the soil with Bordeaux. Research was concentrated on the evolution of disease-resistant varieties in paddy, millets, wheat and cotton. Application of manures and foliage sprays with Urea were found to improve the disease-affected orange trees in Wynaad.

Crops—Paddy.—Evolution of strains for high yields, resistance to blast disease, smut disease, saline and deep-water conditions were in progress and some promising cultures were noted. Application of phosphates to paddy through the green manure crop was again found to be better than direct application.

Millets and pulses.—One high-yielding strain (Co. 19) of Talavirichan cholam was released for distribution and this is expected to benefit 30,000 acres and produce 1,265 tons of additional grains.

Oil seeds.—Mixed cropping trials indicated that groundnut grown mixed with ragi and cotton gave the highest monetary return over other crops grown pure or as mixtures. Spacing trials in gingelly showed that 1 inch × 1 inch spacing is the optimum. About 104,240 quality cocount seedlings raised in Government nurseries were distributed.

Cotton.—Replicated seed nucleus plots of promising culture 9,030 and 5,341 were laid out. Four Karunganni cultures 6,186, 6188, 6,874 and 6,312 were found promising and are being tested in the districts. In the rice fallows a spacing of 1½ feet between rows and 4½ inches within rows was found to record higher yields than wide spacings.

Sugarcane.—In the varietal trials Co. 621, Co. 650, Co. 473, Co. 467 were found promising.

Horticulture.—One more mango hybrid (Neelum × Chinna Suvarnareka) came to bearing. Jamberi as root-stock for Mandarin orange was found to give maximum tree growth. For custard apples the Bullocks-heart and for Sapota, Minusops, Hexandra, were found as suitable root-stocks. Over 53,980 fruit plants were made available to the public.

Systematic Botany.—Compilation of the flora of Tirunelveli district was concluded. In quanity of vettiver grown in Wynaad was found better than that at Pattambi.

Plant physiology.—In the pre-soaking seed studies, optimum period of soaking in nutrient solutions was found to be 12–16 hours. Weed control trials with chemical herbicides were in progress with four important weeds.

Cytogenetics—Cytogenetical studies in paddy and millets were continued.

Agricultural Engineering.—A pedal operated paddy thresher on the Japanese model was manufactured.

Tungabhadra Project.—Fundamental studies on the black soils were continued. The Bagawadi (Bagawadi) demonstration Farm adopted all the improvements found useful at the Agricultural Research Station, Siruguppa.

Colonization Scheme.—In the Araku valley and Wynaad colonies, research and extension work among colonists were continued.

Extension work.—Over 8,860 demonstration plots were laid and 29,916 Agricultural Associations were kept functioning. The following quantities of improved seeds were distributed :—

Paddy	1,684	tons.
Millets	163	,,
Cotton	204	,,
Groundnut (pods)	10,010	lb.
Kernels	952	,,
Castor	458	,,
Gingelly	207	,,
Coconut seedlings	104,240	Nos.
Choice fruit plants	53,980	,,
Vegetable (seeds)	453	lb.
Do. (seedlings)	10,800	Nos.

On the manure side of the propaganda, 61,530 tons of rural compost was estimated to have been produced, two lakhs of acres brought under Sesbania as border crop for green manure and 44,034 tons of ammonium sulphate and 5,730 tons of Super phosphate were arranged for directly or through co-operative societies and firms. Loans to the extent of sixty lakhs of rupees for fertilisers were distributed.

Agricultural marketing.—Grading work in ghee, eggs and potatoes, was helped and it is estimated that 6·3 lakhs worth of Agmark produce was marketed. Work in connection with regulated markets met with a set back due to change of the validity of the commercial crops makets by traders. A review of prices indicated a steady fall due to better internal and international production prospects.

Soil conservation.—In the Rayalaseema preliminaries were completed for extending the contour bunding areas in Hagari, Alur and Guntakal Centres to 6,650 acres in order to complete the entire catchment. With the July rains grasses were raised on contour bunds.

In Chittoor district, 3,557 acres were contour bunded as a famine relief measure. Similarly in Coimbatore 708 acres were contour bunded in Dharapuram taluk employing 300 labourers on an average per day.

In the Nilgiris the pilot project in Ketti valley proved a success and better yields of potatoes were got from protected areas compared with unprotected areas.

Agricultural Engineering.—There were 301 tractors (of which 185 were provided with bulldozer attachment) available for hiring to Agriculturists. They tackled 10,525 acres. Thirteen tractors with matched implements were supplied on hire purchase system.

Seven hundred and sixty-seven portable oil engines were made available for hire for irrigation purposes. Six oil engines and 53 electric motor pump-sets were supplied on hire purchase system.

A new river pumping scheme in Kilithur village in Kumbakonam taluk in Tanjore district was started on 1st July 1953.

Five hundred ninety-five filter point tube wells sanctioned for 1952–53 could be sunk and completely fitted with oil-engine pumpsets for irrigation and an area of 5,950 acres are estimated to be irrigated for these.

APPENDIX No. 1.

Part I.—Rainfall statement (Districtwise) for the Composite Madras State from 1st July to 30th September 1953 (Inches).

Name of the district.	July 1953.		August 1953.		September 1953.	
	Average.	Actuals.	Average.	Actuals.	Average.	Actuals.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Srikakulam	6·4	5·9	7·5	12·3	7·8	8·5
Visakhapatnam	5·8	3·8	5·6	5·7	7·3	9·7
East Godavari	6·9	5·0	6·2	5·6	6·9	4·8
West Godavari	7·8	8·9	7·1	8·3	7·0	5·7
Krishna	7·0	7·0	6·5	6·9	6·2	7·0
Guntur	4·6	4·0	4·9	5·4	5·7	6·4
Kurnool	3·8	5·3	4·0	2·1	5·3	7·1
Bellary	2·6	4 3	3·5	0.8	5·2	..
Anantapur	2·2	5·4	3·3	0·6	5·2	5·3
Cuddapah	3·2	5·4	4·0	2·2	5·0	3·8
Nellore	2·6	2·7	2·9	3·2	4·1	4·5
Chittoor	3·9	3·9	4·1	3·2	5·4	5·5
Chingleput	3·5	2·6	5.0	3·7	5·2	7·3
Madras	..	3·4	..	2·6	..	5·0
South Arcot	2·9	2·7	5·4	4·1	5·7	7·7
North Arcot	3·4	2·9	5·3	4·5	6.5	5·7
Salem	2·5	4·4	4·3	3·2	5·3	7·0
Coimbatore	1·5	2·7	2·1	1·2	2·9	3·5
Tiruchirappalli	1·6	3·2	3·7	3·4	4·9	6·1
Tanjore	1·9	3·0	3·8	1·5	4·2	3·9
Madurai	1·4	2·9	2·7	2·2	3·5	4·9
Ramanathapuram ..	1·2	2·3	2·4	2·3	2·8	3·3
Tirunelveli	0·7	2·3	0·8	0·8	1·1	0·8
Malabar	33·9	49·8	18·6	14·6	8·3	3·0
South Kanara	47·5	72·8	20·7	21·7	12·4	6·6
Nilgiris	14·5	15·2	10·6	11·7	7·1	5·5

N.B.—Average for 1952–53 has been adopted for 1953–54.

APPENDIX No. 2.

Statement showing the varieties of seeds and quantities multiplied in the seed multiplication scheme for the period from 1st July to 30th September 1953.

Serial number and name.	Quantity obtained from Nucleus (i.e.) Agricultural Research Station.		Quantity obtained from seed farms.		Quantity obtained from non-seed farms.		Quantity sold.	
	TONS.	LB.	TONS.	LB.	TONS.	LB.	TONS.	LB.
	(1)		(2)		(3)		(4)	
1 Paddy-seeds ..	23	136	388	1,737	2	1,820	1,683	1,556
2 Millets ..	3	1,400	22	605	0	1,850	163	343
3 Pulses ..	0	330	0	357	0	40	0	364
Millets details—								
Cholam ..	2	685	12	231	0	411	93	1,777
Cumbu ..	0	1,417	6	804	0	1,439	3	1,196
Ragi	0	1,378	3	1,647	..	..	5	1,146
Tenai	0	160	0	163	..	..	60	704
Total ..	3	1,400	22	605	0	1,850	163	343
Pulses details—								
Bengalgram ..	0	93	0	125	..	..	..	..
Redgram ..	0	237	0	232	0	40	0	364
Total ..	0	330	0	357	0	40	0	364

APPENDIX No. 3.

Statement showing the production and distribution of compost for the Composite Madras State.

Serial number and month.	Number of Municipalities and panchayat from which returns received.		Quantity of compost prepared in tons.	Quantity of compost sold in tons.
(1)	(2)		(3)	(4)
	Municipalities	Panchayats.		
1 July 1953	96	335	27,053	28,017
2 August 1953	93	338	25,614	15,839
3 September 1953	60	211	20,700	17,674*
Total ..	..	..	73,467	61,530

* Figures for Residuary State only.

APPENDIX No. 4.

Statement showing the progress of grading work in Madras State during the period 1st July to 30th September 1953.

Serial number, name of the packer and centre.	Quantity.	Value.
		RS.
Eggs in numbers.		
1 M. Rajoo Chettiar, Madras	No grading	..
2 M/s. Eggs and Poultry Mart, Madras	184,453	23,727
3 M. M. Ebrahim Bros., Madras	2,685	301
4 K. N. Govindaswami Pillai, Madras	1,610	183
5 V. C. Inasu, Ootacamund	2,757	341
6 Egg Co-operative Marketing Society, Katpadi ..	40,570	4,964
	232,075	29,516

	Ghee in maunds.		
	Mds.	Srs.	Rs.
1 Sri P. Srinivasa Rao, Ongole	62	27	10,968
2 Lakshmidoss Premji, Guntur	57	14	10,036
3 Amarchand Gulabchand & Co., Tirupur	1,884	6	3,16,640
4 Dhanalakshmi & Co., Tirupur	1,032	30	1,82,797
5 Sri A. S. Arunachalam, Madurai	107	23	19,668
6 Lingam & Co., Coimbatore	44	4	8,107
	3,188	24	5,48,198

	Potatoes.		
1 M/s. N. R. Ranqaswami Naidu, Ketti	No grading		
2 Sri M. N. Ponnuswami, Mettupalayam	2,860	6	48,872

APPENDIX No. 5.

Statement showing the distribution of tractors and bull-dozers in the Composite Madras State.

Serial number and name of district.	With bull-dozers.	Without bull-dozers.	Total.
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	4	8
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	6	3	9
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	8	16
18 Tanjore	4	10	14
19 Tiruchirappalli	7	6	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	2	6
27 South Malabar	5	2	7
28 South Kanara	9	1	10
Total ..	165	137	302

APPENDIX No. 6.

Particulars of types of tractors and their h.p. held by the Department.

Name and type of tractor. (1)	H.P. (2)	Total number of tractors. With bull-dozers. (3)	Without bull-dozers. (4)
Small type—			
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
Medium type—			
I.H.C. W.D. 9	40	..	13
Do. T.D. 9	40	9	2
Do. W.6	30	..	30
Do. T.6	30	21	1
Fordson Major	30	..	3
John Deere AW. and AR.	40	..	23
L.H. K.	40	..	1
I.H.C. T.D. 6	34	6	8
Caterpillar D. 4.	45	32	..
David Brown	25	..	13
Heavy type—			
Caterpillar D. 4	65	58	..
Do. D. 7	75	12	..
U.H.C. T.D. 14	65	27	..
Total ..	..	165	137
		302	

APPENDIX No. 7.

Details showing types and models of tractors with the Agricultural Department

(Composite Madras State.)

Year.	I.H.C. consisting of T.D. 9. T.D. 6. W.D. 9, W.D. 10/20 T.D. 14 W. 6.	John Deer consisting of AR, AW, and A Model.	Caterpillar D 6, D 7, D 4.	L.H. Case.	Messrs. Harris consisting of 30 K, 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	53		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
1953–54 ..	121	23	101	1	40	3	13	302
Numbers attached with bull-dozers.	64	..	101	..	..	..	..	165

APPENDIX No. 8.

Statement showing the districtwar outturn of the departmental tractors and bull-dozers for 1953–54 (*from* 1*st July* 1953 *to* 30*th September* 1953).

(Composite Madras State.)

Serial number and name of district.	Total number of hours bull-dozers worked.	Total outturn (ploughing, levelling and harrowing).
	HOURS.	ACS.
1 North Arcot	1,075	199
2 Chingleput	1,538	987
3 South Arcot	1,643	901
4 Tanjore	468	1,706
5 Tiruchirappalli	1,389	418
6 Madurai	2,069	400
7 Tirunelveli	527	204
8 Salem	2,397	147
9 Coimbatore	2,905	863
10 The Nilgiris	421	13
11 North Malabar	431	78
12 South Malabar	717	106
13 South Kanara	1,054	56
14 Ramanathapuram	386	211
15 Srikakulam	324	72
16 Visakhapatnam	463	115
17 East Godavari	379	54
18 West Godavari	596	181
19 Krishna	573	115
20 Guntur	907	769
21 Nellore	753	856
22 Kurnool	747	173
23 Anantapur	338	116
24 Bellary	1,843	914
25 Chittoor	504	245
26 Araku Valley	..	59
27 Pilot Scheme, Bellary	2,108	539
28 Cuddapah	208	48
Total ..	26,763	10,545

NOTE.—The figures relating to Andhra districts are for July and August 1953 alone. Figures for September 1953 are not available.

APPENDIX No. 9.

Statement showing the progressive increase on the hire charges on tractors and bull-dozers.

(Composite State.)

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 1952.	Rates of hire charges including transport charges from 1st April 1952.
(1)	(2)	(3)	(4)
	RS. (PER ACRE.)	RS. (PER ACRE.)	RS. (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. (PER HOUR.)	RS. (PER HOUR.)	RS. (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. 4	7 0 0	8 0 0	10 0 0
Do. D. 4	5 0 0	8 0 0	10 0 0

APPENDIX No. 10.

Statement showing Acreage tackled by departmental tractors.

	1946-47.	1947-48.	1948-49.	1949-50.	1950-51.	1951-52.	1952-53.	1953-54
Target in acres	..	10,000	43,000	40,000	80,000	1,00,000	80,000	20,000
Outturn in acres ..	4,360	10,025	35,569	58,315	66,720	51,983	52,291	10,545
Number of hours worked by bull-dozers.	11,011	15,525	19,375	38,236	55,344	13,132	138,829	26,763
Additional foodgrains in tons.	1,090	2,500	8,892	8,213	7,281	5,487	6,294	645
Number of tractors with and without bull-dozers.	45	140	152	233	268	293	302	302
Number of bull dozers.	27	27	42	60	136	154	165	165

APPENDIX No. 11.

Statement showing the tractors and implements available with the department.

Particulars.	1945-46.	1946-47.	1947-48.	1948-49.	1949-50.	1950-51.	1951-52.	1952-53.	1953-54.
Tractors	6	45	140	152	233	268	293	302	302
Bull-dozers	..	27	27	42	60	136	154	164	164
Mould Board ploughs. ..	1	25	40	52	105	180	184	184	184
Disc harrows and cultivators.	1	20	33	41	96	96	97	97	97
Disc ploughs ..	7	33	47	193	287	351	355	355	355
Rotavators	..	..	..	..	..	..	9	9	9

APPENDIX No. 12.

Machinery purchased during the year under report.

Nil.

APPENDIX No. 13.

Supply of tractors under hire purchase from 1st July to 30th September 1953.

Description.	Number received.	Name of the firm.	G.O. number and date.
(1)	(2)	(3)	(4)
John Deer Model 40 ..	1	Messrs. Larsen & Toubro.	G.O. Ms. No. 255, Agriculture (Food Production), dated 11th June 1953.
Fergusan	3	Kamani Engineering Corporation.	Do.
Farwal H.	3	Messrs. Volkart Bros ..	Do.
Steyr	2	Jayems Engineering Company.	Do.
Massey Harris	4	Messrs. Rallis' (India) Limited.	Do.
Total ..	13		

APPENDIX No. 14.

Statement showing the jurisdiction of Assistant Agricultural Engineers.

(Composite State.)

Name of Assistant Agricultural Engineer with headquarters.	Name of district in his jurisdiction.
Assistant Agricultural Engineer (Inspection), Anakapalle.	Srikakulam, Visakhapatnam, East Godavari and Araku Valley.
Assistant Agricultural Engineer (Inspection), Vijayavada.	West Godavari and Krishna.
Assistant Agricultural Engineer (Inspection), Tiruchirappalli.	South Arcot, Tanjore and Tiruchirappalli.
Assistant Agricultural Engineer (Inspection), Vellore.	Chittoor, Salem and North Arcot.
Assistant Agricultural Engineer (Inspection), Madurai.	Madurai, Ramanathapuram and Tirunelveli.
Assistant Agricultural Engineer (Tractor Workshop), Bellary.	Bellary, Cuddapah, Kurnool and Anantapur.
Assistant Agricultural Engineer (Tractor Workshop), Bapatla.	Guntur and Nellore.
Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	Coimbatore and Nilgiris.
Assistant Agricultural Engineer, Chingleput at Saidapet.	Chingleput.

Appendix No. 15.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953.

(Prior to the separation of Andhra State.)

Post.	Period. From	Period. To	Name of the officer-in-charge.
Director of Agriculture ..	(Throughout.)		Sri M. S. Sivaraman, I.C.S.
Joint Director of Agriculture (Engineering).	Do.	..	„ B. M. Lakshmipathi.
Joint Director of Agriculture (Extension).	Do.	..	„ M. Kanti Raj.
Headquarters Deputy Director of Agriculture (Research).	Do.	..	„ Dr. K. C. Naik.
Headquarters Deputy Director of Agriculture (Inspection).	Do.	..	„ S. N. Venkataramanan.
Personal Assistant to the Director of Agriculture.	Do.	..	„ E. S. Nagesan.
Accounts Officer	Do.	..	„ K. Viswanathan Nair.
Junior Accounts Officer ..	Do.	..	„ T. Krishna Shetty.
Cane Development Officer ..	1 July 1953 ..	30 Sep. 1953.	„ T. Natarajan.
Gazetted Assistant	1 July 1953 ..	30 Sep. 1953.	„ T. K. Thangavelu.
State Marketing Officer ..	(Throughout.)		„ V. Satagopan.
Assistant Marketing Officer.	Do.	..	„ D. Shanmugasundaram.
Assistant Agricultural Engineer (Headquarters) I.	Do.	..	„ K. P. Sanjeeva Shetty.
Assistant Agricultural Engineer (Headquarters) II.	1 July 1953 ..	24 Sep. 1953.	„ P. K. Radhakanth.
	25 Sep. 1953 ..	30 Sep. 1953.	„ K. P. Sanjeeva Shetty. (additional charge).
Assistant Agricultural Engineer (C.A.E.S.)	(Throughout).		„ K. Natarajan.
Special Deputy Director of Agriculture (Crop Sampling), Madras.	1 July 1953 ..	27 July 1953.	„ K. Venkataraman.
	27 July 1953 ..	29 Sep. 1953.	„ V. Rama Rao.
	30 Sep. 1953 ..	30 Sep. 1953.	„ A. Mohammad Ali.
Special District Agricultural Officer (Crop Sampling), Madras.	(Throughout)		„ K. Santhanam.
Assistant Marketing Officer, Kakinada.	1 July 1953 ..	27 Aug. 1953.	„ V. Suryanarayana.
	28 Aug. 1953 ..	9 Sep. 1953 ..	„ M. Suryanarayana.
	10 Sep. 1953 ..	24 Sep 1953 ..	„ S. M. Sulaiman.
	25 Sep. 1953 ..	30 Sep. 1953.	„ M. Suryanarayana Sastry, Marketing Assistant (additional charge).
Assistant Marketing Officer, Cuddapah.	(Throughout.)		„ T. Krishna Reddy.
Assistant Marketing Officer, Tiruchirappalli.	Do.		„ K. Narayanan Nair.
Assistant Marketing Officer, Coimbatore.	Do.		„ C. Raman Moosad.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period. From	Period. To	Name of the officer-in-charge.
Agricultural College and Research Institute, Coimbatore.			
Principal	(Throughout)		Sri R. Balasubramaniam.
Agronomist and Professor of Agriculture.	Do.	..	„ P. A. Venkateswar Iyer.
Lecturer in Agriculture ..	Do.	..	„ A. H. Subramania Sarma.
Lecturer in Animal Hygiene.	Do.	..	„ S. N. Vaidyanathan (Additional charge).
Lecturer in Agricultural Economics.	Do.	..	„ S. V. Doraiswami Ayyar.
Lecturer in Entomology ..	Do.	..	„ K. P. Ananthanarayanan.
Gazetted Assistant, Lecturer in Entomology.	Do.	..	„ S. Kanakaraj David.
Lecturer in Mycology ..	Do.	..	„ M. Kandaswami.
Lecturer in Chemistry ..	Do.	..	„ M. R. Balakrishnan.
Gazetted Assistant, Lecturer in Chemistry.	Do.	..	„ M. Sundaram.
Systematic Botanist and Professor of Botany.	Do.	..	„ C. Rajasekhara Mudaliar.
Lecturer in Botany	Do.	..	„ D. Daniel Sundararaj.
Lecturer in Civil Engineering.	Do.	..	„ B. K. Sadasiva Rao.
Lecturer in Mechanical Engineering.	Do.	..	„ S. Gonsalves.
Cytogeneticist	Do.	..	Dr. N. Krishnaswamy.
Cytogeneticist, Bapatla, at Coimbatore.	Do.	..	Sri N. Krishnaswamy (additional charge).
Plant Physiologist ..	Do.	..	„ T. R. Narayanan.
Superintendent, Central Farm.	Do.	..	„ K. Ramaswami Ayyar.
Agricultural College, Bapatla.			
Principal	1 July 1953 ..	29 July 1953.	Sri G. Venkatanarayana.
Do.	30 July 1953 ..	19 Aug. 1953.	„ P. D. Karunakar.
Do.	20 Aug. 1953 ..	31 Aug. 1953.	„ M. Narasimhan.
Do.	1 Sep. 1953 ..	10 Sep. 1953.	„ T. Venkataramana Reddy.
Do.	11 Sep. 1953 ..	30 Sep. 1953.	„ G. Venkatanarayana.
Senior Lecturer in Agriculture.	1 July 1953 ..	31 Aug. 1953.	„ Md. Kasim Adeni.
Do.	1 Sep. 1953 ..	11 Sep. 1953.	„ M. Narasimham.
Do.	12 Sep. 1953 ..	30 Sep. 1953.	„ Md. Kasim Adeni.
Junior Lecturer in Agriculture.	1 July 1953 ..	1 July 1953.	„ Do. (additional charge).
Do.	2 July 1953 ..	5 Aug. 1953.	„ Ch. Venkatachalam.
Do.	6 Aug. 1953 ..	30 Sep. 1953.	„ M. Narasimhan.
Lecturer in Chemistry ..	1 July 1953 ..	31 Aug. 1953.	Dr. P. Satyanarayana.
Do. ..	1 Sep. 1953 ..	30 Sep. 1953.	Sri V. V. Kumara Sastry.
Gazetted Assistant Lecturer in Chemistry.	1 July 1953 ..	31 Aug. 1953.	„ V. V. Kumara Sastry.
Do. ..	1 Sep. 1953 ..	30 Sep. 1953.	Dr. A. Maraikulaundai.
Lecturer in Entomology ..	1 July 1953 ..	24 Sep. 1953.	Sri C. S. Balasubramaniam.
Do. ..	25 Sep. 1953 ..	30 Sep. 1953.	„ G. Venkatanarayana (Additional charge.)
Gazetted Assistant Lecturer in Entomology.	1 July 1953 ..	24 Sep. 1953.	„ A. R. Seshadri.
Do.	25 Sep. 1953 ..	30 Sep. 1953.	„ G. Venkatanarayana.
Lecturer in Botany	(Throughout.)		T. Venkataramana Reddy.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer-in-charge.
	Agricultural College, Bapatla—cont.		
Gazetted Assistant to Lecturer in Botany.	(Throughout.)		Sri B. Appala Naidu.
Lecturer in Civil Engineering.	1 July 1953	25 July 1953.	,, M. Seshagiri Rao, Additional charge.
Do.	26 July 1953	24 Sep. 1953.	,, T. Radhakrishnan.
Do.	25 Sep. 1953	30 Sep. 1953.	,, M. Seshagiri Rao, Additional charge.
Lecturer in Mechanical Engineering.	1 July 1953	6 Aug. 1953.	,, M. Seshagiri Rao (additional charge).
Do.	7 Aug. 1953	30 Sep. 1953.	,, V. Chandrasekhara Sastry (additional charge).
Plant Physiologist	1 July 1953	24 Sep. 1953.	Dr. P. Abraham.
Do.	25 Sep. 1953	30 Sep. 1953.	Sri K. Satyanarayanamurthi.
Lecturer in Mycology	1 July 1953	24 Sep. 1953.	,, C. V. Govindaswamy.
Do.	25 Sep. 1953	30 Sep. 1953.	,, G. Venkatanarayana (additional charge).
Lecturer in Agricultural Economics.	1 July 1953	25 Sep. 1953.	Dr. M. Srinivasan.
Do.	26 Sep. 1953	30 Sep. 1953.	Sri I. V. Parthasarathy.
Superintendent, College Farm.	(Throughout.)		,, C. Hanumantha Rao.
	Paddy Section.		
Paddy Specialist	1 July 1953	30 Sep. 1953.	Sri A. Abdul Samad (additional charge).
Agricultural Meteorologist.	(Throughout.)		,, C. Balasubramaniam.
Assistant Paddy Specialist, Coimbatore.	Do.		,, A. Abdul Samad.
Assistant Paddy Specialist, Pattambi.	Do.		,, P. Uttaman.
	Cotton Section.		
Cotton Specialist	(Throughout.)		Sri S. M. Kalyanaraman.
Assistant Cotton Specialist, Coimbatore.	Do.		,, T. V. Rangaswami.
Assistant Cotton Specialist, Tiruppur.	Do.		,, A. Raghavan.
Assistant Cotton Specialist, Srivilliputtur.	Do.		,, C. K. Ramachandran.
Assistant Cotton Specialist, Karunganni Scheme, Koilpatti.	Do.		,, L. Neelakantan.
Assistant Cotton Specialist, K. 2 and Co. 4 Scheme, Koilpatti.	Do.		,, S. Mayandi Pillai.
Assistant Cotton Specialist, Siruguppa.	Do.		,, N. G. Narayanan.
Assistant Cotton Specialist, Hagari.	Do.		,, K. Satyanarayanamurthy.
Assistant Cotton Specialist, Winter Cambodia Scheme, Coimbatore.	Do.		,, V. Ramaswami.
Assistant Cotton Specialist, Narasaraopet.	Do.		,, G. Seshadri Iyengar.
Certification Officer, Rajapalayam.	Do.		,, P. N. Krishnaswami.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer-in-charge.
	Cotton Section—cont.		
Gazetted Assistant to Certification Officer, Rajapalayam.	(Throughout.)		Sri K. Kannian.
Assistant Cotton Specialist, Nandyal.	Do.		,, M. Venkoba Rao.
Chillies Specialist, Guntur	1 July 1953	31 July 1953	,, M. P. Narasimha Rao.
Do.	1 Aug. 1953	27 Aug. 1953.	,, V. V. Krishniah (additional charge).
Do.	28 Aug. 1953	24 Sep. 1953.	,, V. Srinivasan.
Do.	25 Sep. 1953	30 Sep. 1953	,, V. V. Krishniah (additional charge).
Cotton Extension Officer, Coimbatore.	1 July 1953	24 Sep. 1953	,, G. Jagannatha Rao.
Do.	25 Sep. 1953	30 Sep. 1953	,, N. Kesava Iyengar (additional charge).
Assistant Cotton Extension Officer, Coimbatore.	(Throughout.)		,, N. Kesava Iyengar.
Assistant Cotton Extension Officer, Bellary.	1 July 1953	24 Sep. 1953	,, M. Subramania Chetty.
Do.	25 Sep. 1953	30 Sep. 1953	,, A. B. Adisesha Reddi (additional charge).
Assistant Cotton Extension Officer, Madurai.	(Throughout.)		,, R. Krishnamurthy.
Assistant Cotton Extension Officer, Guntur.	(Throughout.)		,, G. R. Padaki.
	Millet Section.		
Millet Specialist	(Throughout.)		Sri M. A. Sankara Iyer (additional charge).
Agricultural Research Station, Coimbatore.	Do.		,, A. Kunhikoran Nambiar.
Assistant Millet Specialist, Coimbatore.	Do.		,, P. Krishnaswami.
Assistant Millet Specialist, Nandyal.	Do.		,, P. Subramaniam.
	Oil-seeds Section.		
Oilseeds Specialist	(Throughout.)		Sri C. R. Seshadri.
Assistant Oilseeds Specialist, Coimbatore (Nursery Scheme).	Do.		,, S. G. Aiyadurai.
Assistant Oilseeds Specialist (Nucleus Seed Farm Scheme).	Do.		,, S. Varisai Muhammad.
Superintendent, Agricultural Research Station, Tindivanam.	Do.		,, M. Bhavanisankar Rao.
Superintendent, Agricultural Research Station, Nileshwar.	Do.		,, P. M. Sayeed.
Cardamom Specialist	1 July 1953	20 Sep. 1953	,, V. Gomathinayagam Pillai.
Do.	21 Sep. 1953	30 Sep. 1953	,, C. R. Seshadri (additional charge).
Pepper Specialist	(Throughout.)		,, P. Govindakutty Kurup.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer-in-charge.
	Horticultural Section.		
Horticulturist and Professor of Horticulture.	(Throughout.)		Sri U. Narasinga Rao.
Assistant Fruit Specialist, Coimbatore (Horticulture).	1 July 1953 ..	24 Sep. 1953	„ K. Sambamurthy.
Do.	25 Sep. 1953 ..	30 Sep. 1953	„ K. Sambamurthy.
Assistant Fruit Specialist, Coonoor.	(Throughout.)		„ K. Fazlulla Khan.
Banana Research Officer, Aduthurai.	Do.		„ T. Gopalan Nair.
Assistant Fruit Specialist (Cashewnut), Mangalore.	Do.		„ V. N. Madhava Rao.
Bio-Chemist, Kodur ..	Do.		„ V. S. Rangacharlu (additional charge).
	Botany Section.		
Systematic Botanist and Professor of Botany.	(Throughout.)		Sri C. Rajasekhara Mudaliar.
Lecturer in Botany ..	Do.		„ D. Daniel Sundararaj.
Systematic Botanist, Aduthurai.	Do.		„ J. Samuel Sundararaj.
	Sugarcane Section.		
Sugarcane Specialist ..	1 July 1953 ..	23 July 1953	Sri M. Lakshmikantam (additional charge).
Do. ..	24 July 1953 ..	24 Sep. 1953	„ S. V. Parthasarathy.
Assistant Agronomist ..	(Throughout.)		„ M. Lakshmikantham.
Assistant Mycologist ..	1 July 1953 ..	24 Sep. 1953	„ C. S. Krishnamurthy.
Assistant Physiologist ..	(Throughout.)		Post kept in abeyance.
Assistant Chemist	1 July 1953 ..	4 Sep. 1953	Sri R. L. Narasimham (additional charge).
Do.	5 Sep. 1953 ..	30 Sep. 1953	„ N. Veera Mohan Rao.
Superintendent, Agricultural Research Station, Anakapalle.	(Throughout.)		„ B. L. Narasimhamurthy.
Superintendent, Sugarcane Liaison Farm, Samalkot.	Do.		„ P. Seetharamiah.
Superintendent, Sugarcane Liaison Farm, Hospet.	1 July 1953 ..	26 July 1953	„ C. Ekambaram.
Do.	27 July 1953 ..	14 Sep. 1953	„ M. Hanumantha Rao (additional charge).
Do.	15 Sep. 1953 ..	30 Sep. 1953	„ C. Ekambaram.
Superintendent, Sugarcane Liaison Farm, Kulittalai.	1 July 1953 ..	11 Sep. 1953	„ E. Jagannadha Rao.
Do.	12 Sep. 1953 ..	30 Sep. 1953	„ S. Ramaswami Iyer.
Superintendent, Sugarcane Liaison Farm, Nellikuppam.	(Throughout.)		„ V. K. Appaji.
	Chemistry Section.		
Government Agricultural Chemist.	1 July 1953 ..	24 Sep. 1953	Sri M. Sanyasi Raju.
Do.	25 Sep. 1953 ..	30 Sep. 1953.	„ M. R. Balakrishnan (additional charge).
Agricultural Bacteriologist ..	(Throughout.)		„ T. Rajagopala Iyengar.
Soil Physicist	Do.		„ F. L. Daniel.
Assistant Agricultural Chemist, Coimbatore.	Do.		„ G. K. Chidambaram.
Assistant Agricultural Chemist, Tanjore.	Do.		„ C. Raghavendrachar.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer-in-charge.
	Entomology Section.		
Government Entomologist ..	1 July 1953 ..	24 Sep. 1953	Sri V. Thirumala Rao.
Do. ..	25 Sep. 1953 ..	30 Sep. 1953.	„ K. P. Ananthanarayana (additional charge).
Assistant Entomologist Coimbatore.	(Throughout.)		„ P. S. Narayanaswami Iyer.
Assistant Entomologist, (Sugarcane Scheme) Coimbatore.	Do.		„ Mohammed Basheer.
Agriculturist	Do.		„ M. S. Subbaiah.
	Mycology Section.		
Government Mycologist.	(Throughout.)		Sri T. S. Ramakrishnan.
Assistant Mycologist (Ergot Scheme), Ootacamund.	Do.		„ K. V. Srinivasan.
	Crop and Plant Protection Officers.		
Crop and Plant Protection Officer (Entomology), Bapatla.	(Throughout.)		Sri N. Raghava Rao.
Crop and Plant Protection Officer (Entomology), Coimbatore.	Do.		„ P. Govinda Rao.
Crop and Plant Protection Officer (Mycology), Coimbatore.	Do.		„ E. R. Gopala Menon.
	Do.		„ N. R. Adyanthiah.
	Agricultural Research Engineering Section.		
Assistant Agricultural Engineer (Research), Coimbatore.	(Throughout.)		Sri J. P. Walter Devasahayam.
Gazetted Assistant to Assistant Agricultural Engineer (Research), Coimbatore.	1 July 1953 ..	31 July 1953.	„ R. Govinda Menon.
Do.	1 Aug. 1953 ..	30 Aug. 1953.	„ J. P. Walter Devasahayam (additional charge).
Do.	31 Aug. 1953 ..	30 Sep. 1953.	„ R. Govinda Menon.
	DISTRICTS.		
	Visakhapatnam Division.		
Deputy Director of Agriculture.	1 July 1953 ..	21 Sep. 1953.	Sri A. Muhammad Ali.
Do.	22 Sep. 1953 ..	30 Sep. 1953.	„ G. Ranganadhaswami (additional charge).
District Agricultural Officer, Anakapalle.	1 July 1953 ..	30 July 1953.	„ G. V. Raghavalu (additional charge).
Do.	31 July 1953 ..	30 Sep. 1953.	„ G. Ranganadhaswami (additional charge).
District Agricultural Officer, Srikakulam.	1 July 1953 ..	10 July 1953.	„ K. Rama Rao (additional charge).
Do.	11 July 1953 ..	24 Sep. 1953.	„ T. S. Francis.
Do.	25 Sep. 1953 ..	30 Sep. 1953.	„ T. Sambasiva Rao.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer-in-charge.
	DISTRICTS—*cont.*		
	Visakhapatnam Division—cont.		
Special District Agricultural Officer, Araku Valley.	(Throughout.)		Sri G. V. Ratnam.
Assistant Agricultural Engineer (Inspection), Anakapalle.	1 July 1953 ..	22 July 1953.	,, Y. Hanumantha Rao.
Do.	23 July 1953 ..	7 Aug. 1953.	,, K. V. Ramalingaswami (additional charge).
Do.	8 Aug. 1953 ..	30 Sep. 1953.	,, P. Ramanujachari (additional charge).
Sugarcane Inspector, Visakhapatnam.	1 July 1953 ..	16 July 1953.	,, A. Muhammad Ali (additional charge).
Do.	17 July 1953 ..	24 Sep 1953.	,, Muhammad Abbas.
	Eluru Division.		
Deputy Director of Agriculture.	(Throughout.)		Sri M. Satyanarayana.
District Agricultural Officer, Eluru.	1 July 1953 ..	31 Aug. 1953.	,, Syed Ibrahim.
Do.	1 Sep. 1953 ..	30 Sep. 1953.	,, S. Ramachandra Rao.
Superintendent, Agricultural Research Station, Samalkot.	1 July 1953 ..	31 Aug. 1953.	,, Syed Ibrahim.
Do.	1 Sep. 1953 ..	30 Sep. 1953.	,, S. Ramachandra Rao.
Superintendent, Agricultural Research Station, Maruteru.	(Throughout.)		,, N. H. V. Krishnamurthi.
District Agricultural Officer, Vijayavada.	Do.		,, K. Bhushanam.
Seed Development Officer (Paddy), Kakinada.	Do.		,, K. B. Viswanadhan.
Additional District Agricultural Officer (Manuring Scheme), Kakinada.	Do.		,, V. V. Jagannatha Rao.
Additional District Agricultural Officer (Manuring Scheme), Eluru.	Do.		,, P. Somayajulu.
Additional District Agricultural Officer (Manuring Scheme), Vijayavada.	Do.		,, Muhammad Zainulabuddin.
Special District Agricultural Officer (Crop Sampling), Kakinada.	Do.		,, M. Somayya.
Special District Agricultural Officer (Crop Sampling), Vijayavada.	1 July 1953 ..	24 July 1953.	,, V. Rama Rao.
Do.	25 July 1953 ..	13 Aug. 1953.	,, K. Bhushanam (additional charge).
Do.	14 Aug. 1953 ..	30 Sep. 1953.	,, Ch. Venkatachalam.
Assistant Agricultural Engineer (Inspection), Vijayavada.	(Throughout.)		,, C. Kalamaratnam.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July 1953 to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer in-charge.
	DISTRICTS—*cont.*		
	Guntur Division.		
Deputy Director of Agriculture, Guntur.	(Throughout)		Sri T. Rangabrahma Rao.
District Agricultural Officer, Guntur.	1 July 1953 ..	24 July 1953.	,, G. Ranganadhaswami.
	24 July 1953 ..	20 Aug. 1953.	,, I. Sambasiva Rao.
	20 Aug. 1953 ..	25 Sep. 1953.	,, G. Venkatakrishnan.
	25 Sep. 1953 ..	30 Sep. 1953.	,, M. Rami Reddy (Additional charge).
District Agricultural Officer, Nellore.	1 July 1953 ..	14 July 1953.	,, V. Kumaraswami.
	15 July 1953 ..	24 Sep. 1953.	,, B. Santhanakrishnan.
	25 Sep. 1953 ..	30 Sep. 1953.	,, V. Kumaraswami.
District Agricultural Officer, Kurnool.	(Throughout)		,, M. Jeevan Rao.
Additional District Agricultural Officer (Manuring Scheme), Guntur.	Do.		,, M. Rami Reddi.
Additional District Agricultural Officer (Manuring Scheme), Nellore.	Do.		,, V. Kumaraswami.
Assistant Agricultural Engineer (Tractor Workshop), Bapatla.	1 July 1953 ..	9 Sep. 1953.	,, C. Seetharamiah.
	10 Sep. 1953 ..	30 Sep. 1953.	,, K. Dwarakanath (Additional charge).
	1 July 1953 ..	31 July 1953.	,, M. P. Narasimha Rao.
	1 Aug. 1953 ..	27 Aug. 1953.	,, V. V. Krishniah.
	28 Aug. 1953 ..	24 Sep. 1953.	,, V. Srinivasan.
	25 Sep. 1953 ..	30 Sep. 1953.	,, V. V. Krishniah.
	Cuddapah Division.		
Deputy Director of Agriculture, Cuddapah.	(Throughout)		Sri Mirza Anser Baig.
District Agricultural Officer, Cuddapah.	1 July 1953 ..	24 Sep. 1953 ..	,, A. K. Annaswami Iyer.
	25 Sep. 1953 ..	30 Sep. 1953 ..	,, T. Krishna Reddi.
District Agricultural Officer, Bellary.	1 July 1953 ..	27 Sep. 1953 ..	,, K. Subba Rao.
	28 Sep. 1953 ..	30 Sep. 1953 ..	,, A. K. Annaswami Iyer.
District Agricultural Officer, Anantapur.	(Throughout)		,, A. B. Adisesha Reddi.
District Agricultural Officer, Chittoor.	1 July 1953 ..	24 Sep. 1953 ..	,, R. Alagiamanavalan.
	25 Sep. 1953 ..	30 Sep. 1953 ..	,, M. Venkatramiah (Additional charge).
Special District Agricultural Officer (Tungabhadra Project), Bellary.	(Throughout)		,, K. Rama Rao.
Seed Development Officer (Millets), Bellary.	1 July 1953 ..	25 Aug. 1953 ..	,, G. Ramabhadran.
Do.	26 Aug. 1953.	13 Sep. 1953 ..	,, M. Subramania Chetty (Additional charge).
Do.	14 Sep. 1953..	24 Sep. 1953 ..	,, G. Ramabhadran.
De.	25 Sep. 1953.		,, Syed Ahamadulla (Additional charge).

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer in-charge.
		DISTRICTS—*cont.*	
		Cuddapah Division—cont.	
Special District Agricultural Officer (Crop Sampling), Bellary.	(Throughout)		Sri T. Devasikamani.
Superintendent, Agricultural Research Station, Hagari.	1 July 1953 ..	15 Aug. 1953 ..	,, S. Ramachandra Rao.
	16 Aug. 1953 ..	30 Sep. 1953 ..	,, B. Suryanarayana murthy.
Assistant Agricultural Engineer (Contour Bunding), Bellary.	1 July 1953 ..	24 Sep. 1953 ..	,, N. Sankaranarayana Reddi.
	25 Sep. 1953 ..	30 Sep. 1953 ..	,, G. M. Sankara Reddy (Additional charge).
Assistant Agricultural Engineer (Inspection), Bellary.	1 July 1953 ..	14 July 1953 ..	,, P. Rajavadan (Additional charge).
	15 July 1953 ..	24 Sep. 1953 ..	,, T. S. Palanivelu.
	25 Sep. 1953 ..	30 Sep. 1953 ..	,, A. B. Adisesha Roddy.
Assistant Agricultural Engineer (Tractor Workshop), Bellary.	1 July 1953 ..	2 July 1953 ..	,, S. Sriramamurthi (Additional charge).
	3 July 1953 ..	24 Sep. 1953 ..	,, S. E. Anantharaman.
	25 Sep. 1953 ..	27 Sep. 1953 ..	,, K. Subba Rao (Additional charge).
	28 Sep. 1953 ..	30 Sep. 1953 ..	,, A. K. Annaswami Iyer (Additional charge).
Agronomist, Siruguppa ..	(Throughout)		,, S. Rajarathnam Chetty.
Superintendent, Fruit Research Station, Kodur.	Do.		,, V. S. Rangacharlu.
Assistant Agricultural Engineer, (Soil Conservation Scheme), Chittoor.	1 July 1953 ..	24 Sep. 1953 ..	,, C. R. Shanmugham.
	25 Sep. 1953 ..	30 Sep. 1953 ..	,, B. Narayana Reddy (Additional charge).
Assistant Agricultural Engineer (Pilot Scheme), Bellary.	(Throughout.)		,, P. Rajavadan.
		Vellore Division.	
Deputy Director of Agriculture.	(Throughout)		Sri G. Sakharama Rao.
District Agricultural Officer, Vellore.	Do.		,, S. V. Ramachandran.
District Agricultural Officer, Salem.	Do.		,, N. Krishna Pillai.
District Agricultural Officer, Guindy.	1 July 1953 ..	14 Sep. 1953 ..	,, K. L. Ramakrishna Rao.
	15 Sep. 1953..	29 Sep. 1953 ..	,, V. G. Venkataramana Rao (Additional charge).
	30 Sep. 1953 ..	30 Sep. 1953 ..	,, S. Santhanakrishna Naidu.
Superintendent, Agricultural Research Station, Tirurkuppam.	(Throughout)		,, M. K. Venkatasubramaniam.
Seed Development Officer (Paddy), Vellore.	1 July 1953 ..	30 Sep. 1953 ..	,, N. C. Thirumalacharya.
Assistant Agricultural Engineer (Inspection), Vellore.	(Throughout)		,, A. K. Subramaniam.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period From	Period To	Name of officer in-charge.
		DISTRICTS—*cont.*	
		Tanjore Division.	
Deputy Director of Agriculture.	(Throughout)		Sri K. Varadachari.
District Agricultural Officer, Tanjore.	Do.		,, N. V. Kalyanasundaram.
District Agricultural Officer, Pattukkottai.	Do.		,, M. J. David.
District Agricultural Officer, Cuddalore.	Do.		,, S. Muthuswami Iyer.
District Agricultural Officer, Tiruchirapalli.	Do.		,, K. H. Subramania Iyer.
Additional District Agricultural Officer (Manuring Scheme), Tanjore.	1 July 1953 ..	26 July 1952 ..	,, N. V. Kalyanasundaram (Additional charge.)
Do.	27 July 1953 ..	30 Sep. 1953 ..	,, M. Vaidyanathan.
Additional District Agricultural Officer (Manuring Scheme), Tiruchirappalli.	(Throughout)		,, L. Krishnan.
Additional District Agricultural Officer (Manuring Scheme), Pattukkottai.	Do.		,, P. K. Nambiar.
Special District Agricultural Officer (Crop Sampling), Tanjore.	1 July 1953 ..	26 July 1953 ..	,, M. Vaidyanathan.
Do.	27 July 1953 ..	30 Sep. 1953 ..	,, E. G. Sivasami.
Superintendent, Agricultural Research Station, Palur.	(Throughout)		,, M. Rayappa Pillai.
Superintendent, Agricultural Research Station, Aduthurai.	Do.		,, K. Ramaswamy.
Seed Development Officer (Paddy), Tanjore.	Do.		,, V. Krishnaswami.
Assistant Agricultural Engineer (Inspection), Tiruchirappalli.	Do.		,, C. R. Subramanian.
		Madurai Division.	
Deputy Director of Agriculture.	1 July 1953 ..	20 July 1953 ..	Sri Md. Obeidulla Shah.
Do.	21 July 1953 ..	5 Aug. 1953 ..	,, K. Varadachari (Additional charge).
Do.	6 Aug. 1953 ..	30 Sep. 1953 ..	,, K. Venkataraman.
District Agricultural Officer, Madurai.	1 July 1953 ..	6 Sep. 1953 ..	,, K. S. Krishnamurthy.
Do.	7 Sep. 1953 ..	13 Sep. 1953 ..	,, K. C. Thomas (Additional charge).
District Agricultural Officer, Sattur.	(Throughout)		,, A. K. Ramasubba Iyer.
District Agricultural Officer, Tirunelveli.	Do.		,, N. S. Rajagopalan.
Additional District Agricultural Officer (Manuring Scheme), Madurai.	Do.		,, K. C. Thomas.
Additional District Agricultural Officer (Manuring Scheme), Tirunelveli.	Do.		,, T. N. Balasubramanian.

Appointments, postings and transfers of Gazetted Officers—Part I from 1st July to 30th September 1953—cont.

Post.	Period. From	To	Name of officer in-charge.
	DISTRICTS—*cont.*		
	Madurai Division—cont.		
Special District Agricultural Officer (Crop Sampling), Madurai.	(Throughout)		Sri K. V. Natesa Ayyar.
Superintendent, Agricultural Research Station, Koilpatti.	Do.		„ B. W. X. Ponnayya.
Assistant Agricultural Engineer (Inspection), Madurai.	1 July 1953 ..	26 July 1953 ..	„ C. S. Sreedharan.
	27 July 1953..	30 Sep. 1953 ..	„ R. S. Subramaniam.
	Coimbatore Division.		
Deputy Director of Agriculture.	1 July 1953 ..	30 Sep. 1955 ..	Sri S. S. Katchapeswara Ayyar.
District Agricultural Officer, Coimbatore.	1 July 1953 ..	7 July 1953 ..	„ B. Santhanakrishnan.
	8 July 1953 ..	30 Sep. 1953 ..	„ J. H. S. Ponnayya.
District Agricultural Officer, Shoranur.	(Throughout)		„ K. Krishnan.
District Agricultural Officer, Mangalore.	Do.		„ P. N. Nayar.
District Agricultural Officer, Tellicherry.	(Throughout)		„ K. Sanjeeva Shetty.
District Agricultural Officer, Ooty.	Do.		„ M. Mukundan.
Curator, Ooty	Do.		„ B. G. Narayana Menon.
Special District Agricultural Officer (Crop Sampling), Shoranur.	Do.		„ P. P. Syed Mohammad.
Superintendent, Agricultural Research Station, Nanjanad.	Do.		„ K. Saptharishi.
Superintendent, Wynaad ..	Do.		„ C. Bhujanga Rao.
Superintendent, Agricultural Research Station, Mangalore.	Do.		„ K. Hanumantha Rao.
Seed Development Officer (Millets), Coimbatore.	Do.		„ U. Achutha Warriar.
Assistant Agricultural Engineer (Soil Conservation Scheme), Ootacamund.	Do.		„ S. Narayanaswami.
Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	1 July 1953.	13 Sep. 1953 ..	„ M. Umapathy.
	14 Sep. 1953 ..	26 Sep. 1953 ..	„ J. P. Walter Devashayam (Additional charge).
Assistant Agricultural Engineer (Groundnut Scheme), Coimbatore.	27 Sep. 1953.	30 Sep. 1953 ..	„ M. Umapathi.
	(Throughout)	..	„ A. M. Muhammad Ali.
Agronomist, Satyamangalam.	Do.	..	„ S. Sundaram.

APPENDIX No. 16,

Strength of staff in the Agricultural Department as on 30th September 1953.

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	10
Agronomist and Professor of Agriculture, Coimbatore	1	..	1
Senior Lecturer in Agriculture, Bapatla	1	..	1
State Marketing Officer	1	..	1
Total ..	9	4	13
Category 4—			
Paddy Specialist	1	..	1
Millet Specialist	1	..	1
Cotton Specialist	1	..	1
Oil seeds Specialist	1	..	1
Fruit Specialist	1	..	1
Sugarcane Specialist	..	1	1
Cotton Extension Officer	..	1	1
Government Agricultural Chemist	1	..	1
Government Entomologist	1	..	1
Government Mycologist	1	..	1
Systematic Botanist and Professor of Botany ..	1	..	1
Total ..	9	2	11
Category 5—			
District Agricultural Officers, Sugarcane Inspection and Seed Development Officers	27	3+10	30+10
Superintendent, Central Farm, Coimbatore ..	1	..	1
Superintendent, College Farm, Bapatla	..	1	1
Agronomist, Siruguppa	1	..	1
District Agricultural Officer (Crop Sampling) ..	..	8	8
Gazetted Assistant, Director of Agriculture's office.	1	..	1
Lecturer in Agriculture, Coimbatore	1	..	1
Junior Lecturer in Agriculture, Bapatla	1	..	1
Assistant Marketing Officers	4	1	5
Agronomist, Agricultural Research Station, Satyamangalam	..	1	1
Cane Development Officer, Director of Agriculture's office	..	1	1
Special District Agricultural Officer, Tungabhadra Project	..	1	1
Principals and Vice-Principals of Community Projects (District Agricultural Officers)	..	3	3
Total ..	36	19 + 10	55 + 10
Category 6—			
Curator, Government Botanic Gardens, Ootacamund	1	..	1
Category 7—			
Lecturer in Agricultural Economics	1	1	2
Assistant Entomologist	5	5	10
Assistant Mycologists (including Sugarcane) ..	2	5	7

Strength of staff in the Agricultural Department as on 30th September 1953—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	8
Assistant Agronomist	..	1	1
Agricultural Bacteriologist	1	..	1
Soil Physicist	1	..	1
Bio-Chemist	1	..	1
Superintendents, Agricultural Research Stations.	11	1	12
Assistant Cotton Specialists	3	9	12
Assistant Paddy Specialists including Seed Development Officer (Paddy)	2	2	4
Assistant Millet Specialist including Seed Development Officer (Millets)	..	5	5
Assistant Oil-seeds Specialist	..	2	2
Assistant Fruit Specialist including Superintendent, Fruit Research Station, Kodur, Superintendent, Wynaad Colonisation Scheme and Banana Research Officer, Aduthurai	2	5	7
Cytogeneticists	2	..	2
Plant Physiologists, Coimbatore and Bapatla and Assistant Physiologist, Anakapalle	1	2	3
Assistant Cotton Extension Officers	..	4	4
Assistant Lecturing and Systematic Botanist, Coimbatore, Lecturer and Gazetted Assistant Lecturer in Botany, Bapatla and Systematic Botanist, Aduthurai	2	2	4
Pepper Specialist	..	1	1
Cardamom Specialist	..	1	1
Superintendent, Sugarcane Liaison Farm	..	4	4
Agricultural Meteorologist	1	..	1
Chillies Specialist	..	1	1
Total	40	54	94
Category 8—			
Assistant Agricultural Engineer (Research)	1	..	1
Gazetted Assistant to Assistant Agricultural Engineer (Research)	..	1	1
Total	1	1	2
Category 9—			
Assistant Agricultural Engineers (Civil)	2	..	2
Assistant Agricultural Engineers (Mechanical)	2	..	2
Assistant Agricultural Engineers (Headquarters).	2	1	3
Assistant Agricultural Engineer (Tractor Workshop)	..	6	6
Assistant Agricultural Engineer (Pilot Scheme, Bellary)	..	3	3
Assistant Agricultural Engineer (Soil Conservation Scheme), Bellary, Nilgiris and Chittoor	..	1	1
Assistant Agricultural Engineer, Groundnut, Machinery Scheme, Coimbatore	..	3	3
	..	1	1
Total	6	15	21
Personal Assistant to the Director of Agriculture (Madras Civil Service, Executive Branch)	1	..	1
Lecturer in Animal Hygiene (Madras Veterinary Service)	1	..	1
Senior Accounts Officer	..	1	1
Assistant Accounts Officer	..	1	1
Junior Accounts Officer	..	1	1
Total	2	3	5
Grand total	109	100 + 10	209 + 10

Statement showing the strength of the non-Gazetted in the Agricultural Department under various categories on 30th September 1953.

Category and name of post.	Number of posts. Permanent.	Temporary.	Total.
Upper Subordinates.			
I. Research Section.			
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
7 Fruit section	14	41	55
8 Sugarcane section	5	1	6
9 Cytogenetics section	1	1	2
10 Plant Physiology section	2	4	6
11 Mycology section	12	10	22
12 Entomology section	17	6	23
13 Chemistry section	24	23	47
14 Pepper section	1	3	4
15 Potato section	3	..	3
16 Curator section	3	..	3
17 Meteriology	1	6	7
18 Librarian section	1	..	1
19 Chillies section	..	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

Statement showing the strength of the non-Gazetted in the Agricultural Department under various categories on 30th September 1953—cont.

Category and name of post.	Number of posts. Permanent.	Temporary.	Total.
Upper Subordinates—*cont.*			
III. Engineering Staff.			
1 Agricultural Engineering Supervisors	24	54	78
2 Tractor Foreman	12	29	41
3 Assistant Tractor Foreman	12	18	30
4 Senior mechanic	1	28	29
5 Junior mechanic	1	1	2
6 Senior Tractor driver	..	100	100
7 Junior Tractor driver	..	240	240
8 Oil Engine and Pumpset driver	..	700	700
9 Lorry driver	..	40	40
10 Jeep driver	..	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 driver	..	6	6
17 Millers	..	2	2
Total	50	1,629	1,679

PART I.

Strength of non-gazetted staff as on 30th September 1953.

Category and name of posts.	Number of posts. Permanent.	Temporary.	Total.
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	230	282
6 Lower Division Clerks (including Store-keeper, I grade)	252	807	1,059
7 Typists and steno-typist	57	100	157
8 Store-keepers, II Grade	8	9	17
9 Store-keepers. III Grade	..	25	25
Total			
Madras Agricultural Subordinate Service.			
Fieldmen	203	961	1,164

PART I—*cont.*

Strength of non-gazetted staff as on 30th September 1953—cont.

Category and name of post.	Number of posts. Permanent.	Temporary.	Total.
	504	1,742	2,264
1 Demonstration Maistries	9	7	16
2 Artists	5	2	7
3 Mechanics	1	..	1
4 Sanitary Inspector	1	1	2
5 Librarians	1	..	1
6 Ward attendant	..	1	1
7 Foreman	1	..	1
8 Museum Curator	1	..	1
9 Compounder	..	1	1
10 Blacksmiths	2	..	2
11 Drivers	1	..	1
12 Insectory attendant	19	10	29
13 Laboratory attenders	..	3	3
14 Teachers	7	20	27
15 Attenders			
Total			

APPENDIX No. 17.

List of temporary posts in Upper Subordinate Service as on 30th September 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)
			Madras Agricultural Subordinate Service—cont.					
1	4	Sugarcane Scheme, Anakapalle.	Assistants in Agronomy ..	2	Permitted to continue the scheme for five years in G.O. Ms. No. 5549, Development, dated 29th December 1952.	1st April 1952 ..	31st March 1957 ..	D-I-677/52, dated 6th January 1953.
			Assistants in Physiology ..	2				
			Assistants in Mycology ..	2				
			Assistants in Entomology ..	2				
			Assistants in Chemistry ..	2				
2	13	Wynaad Colonization Scheme.	Farm Managers	4	G.O. No. 1165, Development, dated 6th April 1953.	1st April 1953 ..	31st March 1954 ..	L. 163/53, dated 6th April 1953.
			Additional Farm Manager.	1				
3	21	Cotton Seed Multiplication Schemes in Coimbatore district.	Special Agricultural Demonstrators.	5	Government Memorandum No. 84515-K/52-13, dated 6th July 1953,	Beyond 30th June 1953.	..	Y-3. 314/53, dated 12th July 1953.
4	43	Scheme for breeding varieties of Cambodia cotton at Siruguppa.	Cotton Assistants	5	G.O. No. 2105, Food and Agriculture, dated 11th November 1950.	1st April 1950 ..	31st March 1955 ..	Y. 581/49, dated 23rd November 1950.
5	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 November 1951.	22nd November 1956.	Y. 1908/52, 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 April 1953 ..	22nd April 1954 ..	X. 18/53, dated 9th February 1953.
7	72	Hybrid Cumbu Scheme, Coimbatore.	Millet Assistants	4	G.O. Ms. No. 539, Food and Agriculture, dated 28th March 1952.	20th March 1952 ..	19th March 1957 ..	D-1-946/51, dated 1st April 1952.
8	84	Agricultural College, Bapatla.	Teaching Assistants in Agriculture.	2	G.O. Ms. No. 341, Food and Agriculture, dated 12th March 1953.	1st April 1953 ..	31st March 1954 ..	X. 45/53.
			Teaching Assistants in Agricultural Economics.	2				
			Teaching Assistant in Agricultural Mycology.	1				
			Teaching Assistant in Cytogenetics.	1				
			Farm Managers	2				
9	89	Improvement of agricultural practices in Parvatipur division.	Agricultural Demonstrators.	2	G.O. Ms. No. 418, Food and Agriculture, dated 24th March 1953.	1st April 1953 ..	31st March 1954 ..	D. Dis. L. 132/53, dated 31st March 1953.
10	90	Indian Central Cotton Committee Scheme for the multiplication, distribution and marketing of Co. 4 cotton in Madras State.	Do. ..	8	G.O. Ms. No. 1010, Food and Agriculture, dated 1st April 1954.	30th September 1953.	31st January 1955..	Y-2-351/53, dated 25th June 1953.
11	96	Schemes for the improvement of chillies in the Province.	Assistants	2	G.O. Ms. No. 1199, Food and Agriculture, dated 9th June 1951.	1st Apr. 1952 ..	31st Mar. 1954 ..	D-1. 178/50, dated 16th June 1951.
12	101	Teaching Assistants in Horticulture, Bapatla.	Assistant	1	G.O. No. 1501, Food and Agriculture, dated 9th June 1951.	10th Dec. 1952 ..	9th Dec. 1953 ..	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 26th Oct. 1948.
14	104	Additional staff for plant protection work in districts.	Do.	42	G.O. No. 72, Food and Agriculture (Food Production), dated 10th March 1954.	1st Apr. 1954 ..	31st Mar. 1955 ..	L. 2237/51, dated 29th Mar. 1952.
15	110	Additional staff for Mycology and Botany sections—Agricultural College, Bapatla.	Assistants in Botany and Mycology.	2	G.O. Ms. No. 208, Food and Agriculture, dated 18th February 1953.	1st Apr. 1953 ..	31st Mar. 1954 ..	D. Dis. X. 123/53, dated 26th Feb. 1953.
16	114	Scheme for Banana Research at Maruthuvakudi, Kumbakonam taluk, under Superintendent, Agricultural Research Station, Aduthurai.	Assistants	2	G.O. No. 6241, Development, dated 16th December 1948.	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.		
			Agricultural Demonstrators.	24				
18	116	Grow More Food Scheme No. 1 contour bunding and contour trenching in Ceded Districts.	Soil Conservation Assistants.	3	G.O. Ms. No. 3318, Development (Planning and Development), dated 2nd August 1952.	8th Aug. 1952 ..	7th Aug. 1953 ..	TT-3. 1771/52, dated 8th Aug. 1952.
19	122	Scheme for the production of improved strains of millets at Regional Research Stations.	Millet Assistants	4	G.O. No. 1505, Development, dated 24th March 1949.	1st Apr. 1949 ..	31st Mar. 1954 ..	X. 767/47, dated 28th Mar. 1949.
20	125	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	126	Assistant in Oil Seeds—Agricultural (Coconut) Research Station, Pilicode.	Additional Assistant in Oil Seeds.	1	G O. No. 471, Food and Agriculture, dated 20th March 1953.	23rd May 1953 ..	22 nd 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	129	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	132	Scheme for the improvement of white northerns in Madras State.	Upper Subordinates ..	2	G.O. Ms. No. 2532, Development, dated 29th May 1953.	25th June 1953 ..	24th June 1954 ..	Y. 219/53, dated 7th June 1953.

List of temporary posts in Upper Subordinate Service as on 30th September 1953—*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)
			Madras Agricultural Subordinate Service—cont.					
25	134	Improvement of western cotton in the Madras State.	Assistants	3	G.O. Ms. No. 2362, Development, dated 3rd May 1949.	1st Apr. 1949 ..	31st Mar. 1954 ..	Y-2. 558/48, dated 10th May 1949
26	135	Scheme for the improvement of Tinnevellies and Karunganni cotton.	Do.	8	G.O. No. 2365, Development, dated 3rd May 1949.	..	31st Mar. 1954 ..	Y-2. 702/48, dated 10th May 1949.
27	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 ..	D-1 39/53, dated 10th June 1953.
28	142	Indian Council of Agricultural Research—Scheme for research on the control of striga attack on sorghum.	Assistants in millets ..	2	G.O. Ms. No. 1323, dated 28th June 1951.	22nd Sep. 1953 ..	21st Sep. 1954 ..	D-1 331/51, dated, 7th July 1951.
29	143	Firka Development work—Tirumangalam firka, Madurai district.	Special Agricultural Demonstrator.	1	G.O. No. 446, Rural Welfare Department, dated 25th March 1953.	1st Apr. 1953 ..	31st July 1953 ..	L. 1140/53.
30	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 ..	..
31	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 ..	..
32	145	Seed Development Scheme ..	Assistants	38	G.O. Ms. No. 109, Food and Agriculture (Food Production), dated 19th March 1953.	1st Apr. 1953 ..	31st Mar. 1954 ..	..
33	154	Scheme for the establishment of a Cocoanut Nursery in Tiruchirappalli district.	Assistant	1	G.O. Ms. No. 334, Food and Agriculture, dated 23rd February 1950.	29th Apr. 1950 ..	28th Mar. 1955 ..	D-2. 547/49.
34	156	Fruit and Fruit Products Developments Scheme for the establishment of Model orchards *cum* nurseries.	Assistants	5	G.O. No. 811, Food and Agriculture, dated 29th April 1950.	9th Dec. 1951 ..	8th Dec. 1956 ..	..
35	157	Additional Staff for Bapatla College Farm.	Farm Managers .. .. 2 Dairy Manager 1		G.O. Ms. No. 341, Food and Agriculture, dated 12th March 1953.	1st Apr. 1953 ..	31st Mar. 1954 ..	N. 45/53, dated Mar. 1953.
36	159	Improvement to Todas in the Nilgiris.	Special Agricultural Demonstrator.	1	G.O. No. 817, Food and Agriculture, dated 27th May 1953.	1st May 1953 ..	30th Apr. 1954 ..	L-4.-600/53, dated 3rd June 1953.
37	160	Opening of a Research Station for work on deep water paddy in West Godavari district.	Assistant in Paddy ..	1	G.O. No. 976, Food and Agriculture, dated 29th May 1950.	17th Dec. 1950 ..	16th Dec. 1955 ..	..
38	166	Co-ordinated crop weather scheme.	Assistant in Meteorology ..	5	G.O. No. 923, Food and Agriculture, dated 15th June 1953.	..	25th Jan. 1954 ..	D-2-492/53.
39	167	Scheme for the training of Agricultural and Science graduates in Horticulture.	Horticultural Instructor .. 1 Trainees 20		G.O. Ms. No. 1384, Food and Agriculture, dated 27th August 1952.	14th Aug. 1952 ..	13th Aug. 1954 ..	Y. 44/52, dated 4th Sep. 1952.
40	169	Agricultural Meteorology—Meteorological section–Statistical Assistant.	Technical Assistant	1	G.O. No. 117, Food and Agriculture, dated 12th May 1953.	1st Apr. 1953 ..	31st Mar. 1954 ..	R. Dis. D. 33/53, dated 22nd May 1953.
41	176	Scheme for breeding of unirrigated Combodia Cotton in Madras State.	Assistant in Cotton ..	1	G.O. Ms. No. 169, Food and Agriculture, dated 3rd September 1950.	26th Oct. 1950 ..	25th Oct. 1955 ..	..
42	177	Indian Council of Agricultural Research Scheme for the improvement of sweet potato and tapioca.	Research Assistants ..	3	G.O. Ms. No. 177, Food and Agriculture, dated 16th May 1953.	1st Oct. 1953 ..	30th Sep. 1956 ..	D-1-1486/52, dated 20th May 1953.
43	178	Indian Central Cotton Committee—Mungari cotton scheme in Madras State.	Assistant in Cotton	1	G.O. Ms. No. 1675, Food and Agriculture, dated 17th August 1950.	24th May 1950 ..	23rd May 1955 ..	Y-925/50.
44	179	Irrigation projects—Tungabhadra Project—Localization of ayacut—Employment of Agricultural staff.	Agricultural Demonstrators.	3	G.O. Ms. No. 959, Food and Agriculture, dated 6th March 1953.	28th Nov. 1953 ..	27th Nov. 1953 ..	..
45	180	Additional staff of four Assistants in Chemistry for the Agricultural Research Institute, Coimbatore.	Assistants in Chemistry ..	4	G.O. Ms. No. 1793, Food and Agriculture, dated 19th November 1952.	15th Dec. 1952 ..	16th Dec. 1953 ..	X. 1654 dated 25th Nov. 1952.
46	188	Bifurcation of Malabar district.	Personal Assistant to District Agricultural Officer, Tellicherry. 1 Plant Protection Assistants. 2		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.
47	189	Indian Central Coconut Committee—Scheme for the establishment of Coconut Research Station in East Godavari district.	Assistant	1	G.O. Ms. No. 855, Food and Agriculture, dated 28th April 1951.	..	..	Y. 469/53, dated 22nd May 1953.
48	191	Fruit products—Development—Improvement of fruit Industry in Kodaikanal Hills.	Agricultural Demonstrator..	1	G.O. Ms. No. 723, Food and Agriculture, dated 13th May 1953.	11th July 1953 ..	10th July 1954 ..	Y. 469/53, dated 12th May 1953.
49	192	Opening of an Agricultural Research Station at Satyamangalam in the Lower Bhavani Project area.	Chemistry Assistant .. 1 Farm Manager 1		G.O. Ms. No. 1457, Food and Agriculture, dated 21st Sep. 1953.	7th Aug. 1953 ..	6th Aug. 1955 ..	D-3. 171/53, dated 12th May 1952.
50	195	Indian Central Oilseeds Committee—Scheme to run six zonal nucleus seed farms of improved oilseed strains.	Oilseeds Assistants	6	G.O. Ms. No. 1082, Food and Agriculture, dated 25th May 1951.	29th Dec. 1951 ..	28th Dec. 1956 ..	D-3. 619/50 dated 1st June 1951.

ADMINISTRATION REPORT OF THE AGRICULTURAL DEPARTMENT FOR THE YEAR 1st OCTOBER 1953 TO 30th JUNE 1954.

PART II.

I. ADMINISTRATION.

1. An event of importance was the formation of Andhra State from 1st October 1953. Due to partition the cadre strength in the Madras Agricultural Service fell from 107 to 63.

(1) Sri M. S. Sivaraman, I.C.S., continued as Director of Agriculture throughout the period under report. Sri B. M. Lakshmipathi Mudaliar was Joint Director of Agriculture (Engineering) till 30th October 1953 afternoon. From 1st November 1953 the post of Joint Director of Agriculture (Engineering) was down-graded as Headquarters Deputy Director of Agriculture (Engineering) and Sri B. M. Lakshmipathi Mudaliar continued in the post throughout the period under report. The post of Joint Director of Agriculture (Extension) was abolished on 1st October 1953 and Sri M. Kanti Raj who held the post was allotted to Andhra State from 1st October 1953.

(2) Dr. K. C. Naik and Sri S. N. Venkataramana Iyer continued as Headquarters Deputy Director of Agriculture (Research) and Headquarters Deputy Director of Agriculture (Inspection and General), respectively throughout the period under report.

(3) Sri E. S. Nagesan was Personal Assistant to the Director of Agriculture till 17th October 1953. Sri V. Seetharama Servai held the post from 18th October 1953 to 9th March 1954. Sri W. G. Janakiraman took charge as Personal Assistant on 10th March 1954 and continued throughout the period under report.

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

(1) Sri M. S. Kylasam, Assistant Entomologist as Assistant Entomologist (Civil Supplies) till 24th February 1954.

(2) Sri U. B. Mohammed Abbas, District Agricultural Officer, as Special Officer for Rice, Visakhapatnam, from 19th October 1953.

(3) Sri K. Brahmachari, Assistant Entomologist, as Assistant Entomologist (Civil Supplies) from 8th December 1953 to 14th July 1954.

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

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

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

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

(4) Sri K. V. Srinivasan, Assistant Mycologist, as Mycologist, Sugarcane Breeding Institute, Coimbatore, from 1st December 1953.

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

(6) Sri G. K. Chidambaram, Assistant Agricultural, Chemist, as Regional Officer, Fertiliser Demonstration Scheme, Madras, from 26th June 1954.

List of temporary posts in Upper Subordinate Service as on 30th September 1953—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)
			Madras Agricultural Subordinate Service—cont.					
51	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. 879/53, dated 16th July 1953.
52	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/4-1363/52.
53	200	Indian Council of Agricultural Research Scheme for manurial varietal and agronomic trials to determine optimum yield.	Statistical Assistant in Chemisty. Assistants in Chemistry .. Analytical Assistants .. Assistants for Soil Survey.	1 5 2 7	G.O. No. 1581, Food and Agriculture, dated 7th August 1951.	19th Sep. 1951 ..	18th Sep. 1954 ..	D-1-532/51, dated 11th August 1951.
54	202	Indian Council of Agricultural Research—Scheme for conducting research on cashewnut 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.
55	205	Opening of an Agricultural Farm at Paramakudi.	Farm Manager	1	G.O. No. 1740, Food and Agriculture, dated 1st September 1951.	1st April 1953 ..	31st March 1954 ..	X. 993/50, dated 12th September 1951.
56	208	Scheme for the investigation of stem breaking disease of arecanut palm.	Assistants in Mycology ..	3	G.O. No. 1800, Food and Agriculture, dated 10th September 1951.	1st August 1952 ..	31st July 1962 ..	D-2. 459/49, dated 21st September 1951.
57	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.
58	212	Scheme for multiplication and distribution of C. 1 and 336-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.
59	215	Indian Council of Agricultural Research Scheme for investigational of the possibilities of pre-soaking seeds in nutrient salt as method of improving crop yield.	Assistant in Plant Physiology.	1	G.O. No. 569, Food and Agriculture, dated 31st March 1952.	1st April 1952 ..	31st March 1955 ..	D-1-927/51, dated 4th April 1952.
60	217	Appointment of an additional Agricultural Demonstrator for Cheepurupalli taluk.	Additional Agricultural Demonstrator.	1	G.O. Ms. No. 579, Food and Agriculture, dated 29th September 1953.	5th May 1953 ..	4th May 1954 ..	..
61	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.	....	..
62	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.	....
63	225	Scheme for the establishment of Zonal Parasite Breeding Stations for Biological Control of Nephantis Serinopa.	Assistants in Entomology ..	2	G.O. No. 1111, Food and Agriculture, dated 9th July 1952.	..	26th June 1954 ..	L-1-927/52.
64	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.
65	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.
66	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 September 1953.	Different periods in different districts.	.. ..	D-2-1538/52, dated 4th March 1953.
67	235	Employment of Special Agricultural staff of the firkas selected during 1952-53—training of.	Agricultural Demonstrators.	2	G.O. Ms. No. 673, Rural Welfare, dated 18th May 1953.	1st Aug. 1953 ..	31st December 1953.	L-4-1131/53, dated 1st June 1953.
68	236	Agricultural—Soil conservation—Training of non-Andhra subordinates at Bellary.	Agricultural Demonstrators.	4	G.O. Ms. No. 2504, Development (Planning and Development), dated 20th May 1953.	Not filled	Not filled ..	TT. 3-2160/52, dated 10th June 1953.
69	237	Indian Council of Agricultural Research—Scheme for breeding of piricularia 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 ..	29th June 1956 ..	..
70	238	Training of Demonstration Maistris at Anakapalle and Aduthurai.	Special Agricultural Demonstrators.	2	G.O. No. 1877, Food and Agriculture, dated 18th June 1953.	30th July 1953 ..	31st December 1953.	V. 272/52, dated 18th June 1953.
71	239	Physical Director for Agricultural College, Coimbatore and Bapatla.	Physical Directors	2	G.O. Ms. No. 398, Food and Agriculture, dated 31st March 1953.	Do. ..	Do.	X-1-1913/52, dated 1st April 1953.
72	240	School of Research in Mycology.	Mycology Assistants ..	2	G.O. No. 1204, Food and Agriculture, dated 29th July 1953.	5th Oct. 1953 ..	4th Feb. 1954 ..	D-1-744/53, dated 4th August 1953.

4. Officers who were on foreign service were—

(1) Sri K. Kunhikannan Nambiar, Superintendent, Agricultural Research Station, as Secretary, Indian Central Arecanut Committee, from 25th October 1949.

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

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

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

(5) Sri S. Sampath, Cytogeneticist under the Central Rice Research Institute, Cuttack, from 28th January 1953.

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

(7) Sri M. M. Krishna Marar, Assistant Oilseeds Specialist, on other duty under the Central Coconut Research Station, Kasaragod.

(8) Sri K. V. Natesa Iyer, District Agricultural Officer, as Secretary, South Arcot Market Committee, from 17th January 1954.

(9) Sri S. V. Doraiswami Iyer, Lecturer in Agricultural Economics, on other duty under the University of Madras from 16th June 1954.

5. Officers on deputation to Andhra and Mysore States after partition were—

(1) Sri S. E. Anantaraman, Assistant Agricultural Engineer, as Assistant Agricultural Engineer (Headquarters), Andhra Director of Agriculture's office.

(2) Sri P. K. Radhakanth, Assistant Agricultural Engineer, as Assistant Agricultural Engineer (Inspection), Cuddapah.

(3) Sri S. Rajaratnam Chetty, District Agricultural Officer, as Agronomist, Agricultural Research Station, Siruguppa (Mysore State).

6. New posts sanctioned were as follows :—

(1) Additional District Agricultural Officers (Manuring Scheme) (5) at Tanjore, Pattukkottai, Tiruchirappalli, Madurai and Tirunelveli.

(2) Principals, Basic Agricultural Training Schools (6) (District Agricultural Officer's cadre) at T. Kallupatti (Madurai district), Pattukkottai, Aduthurai, Taliparamba, Koilpatti and Bhavanisagar (Coimbatore district).

(3) Sugarcane Agronomist, Gudiyattam.

(4) Cytogeneticist for scheme for fundamental research on Cytology on Groundnut in the Madras State.

(5) Assistant Agricultural Engineer for soil Conservation Scheme in Coimbatore district.

(6) Assistant Agricultural Engineer (Research) for the Survey of indigenous agricultural implements in common use in the country.

7. Posts abolished due to the partition of the State were—

A. (1) Gazetted Assistant, Director of Agriculture's office, Madras, revived from 21st December 1953.

(2) Cane Development Officer, Madras.
(3) Senior Accounts Officer, Director of Agriculture's office, Madras.
(4) The Special District Agricultural Officer (Crop Sampling), Madras.
(5) The Assistant Agricultural Engineer (Headquarters), Madras.
(6) Assistant Millets Specialist, Coimbatore.

B. (7) Assistant Paddy Specialist, Pattambi (revived from 27th March 1954).

(8) Assistant Paddy Specialist, Coimbatore.

(9) The Soil Physicist, Coimbatore.
(10) The Assistant Agricultural Chemist, Coimbatore.
(11) The Assistant Mycologist, Coimbatore.
(12) The Assistant Entomologist, Coimbatore.
(13) The Assistant Oilseeds Specialist, (Zonal Nucleus Seed Farm Scheme), Coimbatore.
(14) Assistant Fruit Specialist (Orchard-*cum*-Nurseries), Coimbatore.

C. (15) Special Deputy Director of Agriculture (Crop Sampling, Madras)—
(*a*) Post revived temporarily from 21st December 1953.
(*b*) Post revived permanently from 10th March 1954.
(*c*) Post down-graded to Senior District Agricultural Officer.

II. INSPECTION AND AUDIT.

The Director of Agriculture inspected the following Agricultural Research Stations :—

(1) Aduthurai.*
(2) Paramakudi.
(3) Pattukkottai.*
(4) Model Orchard, Periyakulam.
(5) Model Orchard, Thimmapuram.
(6) Breeding Stations at Coimbatore.
(7) Koilpatti.
(8) Mangalore.
(9) Nileshwar.
(10) Taliparamba.
(11) Pattambi.
(12) Nanjanad.
(13) Kallar and Burliar Fruit Stations.*
(14) Government Botanic Gardens, Ootacamund.
(15) Ambalavayal.
(16) Sim's Park, Coonoor.

* Visited more than once.

The office inspection of the Principal's office was conducted by Director of Agriculture at Coimbatore on 16th November 1953.

2. *Headquarters Deputy Director of Agriculture.*—The Deputy Director of Agriculture, Headquarters (Research), inspected the Agricultural Research Stations at Tindivanam, Paramakudi, Aduthurai, Palur, Nanjanad and Pattambi, Banana Research Station, Aduthurai, Zonal Nucleus Seed Farms at Srivilliputhur, Sugarcane Liaison Farm, Nellikuppam, Ginger Scheme and Coconut Nursery at Pattambi, Government Botanic Gardens and Ergot Farm at Ootcamund, Pomological Station and Sim's Park at Coonoor, Kallar and Burliar Fruit Stations, Millets Breeding Station, Coimbatore, Entomology, Oilseeds and Horticultural Sections and Cotton Extension Scheme at Coimbatore. The Millets and Pulses Section and Entomology section were inspected a second time according to the latest questionnaire prescribed by Government.

3. The Deputy Director of Agriculture, Headquarters (Engineering), inspected the office of the Assistant Agricultural Engineer (C.A.E.S.), Saidapet, the Assistant Agricultural Engineer (Research), Coimbatore, and the Assistant Agricultural Engineer (Tractor Workshop), Coimbatore, and found the efficiency and overall discipline satisfactory.

4. The Deputy Director of Agriculture, Headquarters (Inspection), inspected the following offices during the period :—

(1) State Marketing Officer, Madras.
(2) Deputy Director of Agriculture, Coimbatore.

(3) Cotton Extension Officer, Coimbatore.
(4) Pepper Specialist, Taliparamba.
(5) Systematic Botanist and Professor of Botany, Coimbatore.
(6) Government Agricultural Chemist, Coimbatore.
(7) Cotton Specialist, Coimbatore.
(8) Horticulturist and Professor of Horticulture, Coimbatore.
(9) Millet Specialist, Coimbatore.
(10) Agronomist, Coimbatore.
(11) Crop and Plant Protection Officer (Entomology), Coimbatore.
(12) Crop and Plant Protection Officer (Mycology), Coimbatore.
(13) Seed Development Officer, Millets, Coimbatore.
(14) Deputy Director of Agriculture, Madurai.
(15) Deputy Director of Agriculture, Tanjore.
(16) Banana Research Station, Aduthurai.
(17) Seed Development Officer, Tanjore.
(18) Paddy Specialist, Coimbatore.
(19) Government Mycologist, Coimbatore.
(20) Government Entomologist, Coimbatore.

The offices were found to be generally maintained satisfactorily and efficiently with no serious defects.

5. *Regional Deputy Director of Agriculture.*—The Regional Deputy Director of Agriculture inspected the offices and work of the District Agricultural Officers and Agricultural Demonstrators. In general work was found to be satisfactory. The subordinate officers were noted to have performed the required tours and inspections. Office procedures were found to be carried on better though slight delay was noted in some offices. Records in some offices were not maintained properly due to want of adequate space and staff. The following are the particulars of inspections made :—

Deputy Director of Agriculture.	Number of offices required to be inspected.	Number actually inspected.	Remarks.
Tanjore	8	8	Satisfactory.
Vellore	2	1	The inspection of the other office will be taken up in the second half-year.
Madurai	7	7	Satisfactory.
Coimbatore	7	7	Satisfactory.

6. *Heads of Research Sections.*—The Heads of Research Sections conducted the inspection of 12 out of 22 offices and work of their subordinate officers. The following are the details of inspections done :—

	Number of offices required to be inspected.	Number actually inspected.
Government Agricultural Chemist	3	2
Government Mycologist	2	1
Cotton Specialist	3	3
Paddy Specialist	3	2
Millets and Pulses Specialist	4	1
Oilseeds Specialist	3	1
Horticulturist and Professor of Horticulture ..	4	2

The work and offices were found to be satisfactory and efficiently kept in general.

7. *Audit and inspection by the internal audit party.*—Immediately after the partition of the Andhra State there were only three audit parties for audit and inspection and as this was insufficient another party was sanctioned from 1st March 1954. The following offices were audited and inspected during the period under report :—

Name of office.	Number audited and inspected.
1 Heads of research sections	5
2 Agricultural research stations, centres, coconut nurseries and sugarcane liaison farms	28
3 Deputy Directors of Agriculture	4
4 District Agriculture Officers	13
5 Agricultural depots	106
6 Seed Development Officers	3
7 Assistant Marketing Officers	3
8 Assistant Agricultural Engineers	5
9 Assistant Cotton Specialists	4
10 Special District Agricultural Officer (Crop Sampling).	1
11 Principal, Agricultural College, Coimbatore ..	1
12 Other heads of offices	3
Total ..	176

III. AGRICULTURAL EDUCATION.

Agricultural College, Coimbatore—(*a*) *B.Sc.* (*Ag.*) *degree course.*—The number of students on roll in each of the three classes of the B.Sc. (Ag.) at the end of the academic year 1953-54 was as follows :—

First Year B.Sc. (Ag.)—96.
Second Year B.Sc. (Ag.)—86.
Final Year B.Sc. (Ag.)—68.

(*b*) *Post-graduate Diploma Course in Horticulture.*—The total hours of theory classes held for this course were three hundred and those of practical classes including laboratory and symposia 495. A programme of Special lectures by the staff of the Government Mycologist, Government Entomologist and Systematic Botanist was also arranged.

The trainees were sent on tour for twenty-seven days to the Fruit Stations at Coonoor, the Banana Reserach Station, Aduthurai, Government Botanic Gardens, Ootacamund, Sim's Park, Coonoor, Fruit Centres, Taliparamba and Wynad, and to several other places of horticultural interest like Eruvadi, Pattiveeranpatti, etc., where large scale commercial orcharding is being practised or where plantation crops such as tea, coffee and pepper are being grown.

(*c*) *Short courses.*—Sri S. Swaminathan of Karaikudi and Sri A. Kandaswami Chettiar were given practical training in Agriculture at the Central Farm.

(*d*) *Refresher Course.*—The Refresher Course was conducted till the end of December 1953. All the fourteen trainees secured the full benefit of the instructions and went back to their lands.

(*e*) *Student's tour.*—The students were taken on long tours to study the local agricultural practices in vogue as typical centres. The final year students were taken on tour to Agricultural Reserach Station and Banana Research Station, Aduthurai, Vengu Chettiar's Farm near Mallayam, Milk Supply Union, Ayanavaram, Madras, Poultry Farm, Teynampet, Madras, Livestock

Research Station, Hosur, Agricultural College, Hebbal, Military Dairy Farm, Indian Institute of Dairy and Horticultural Gardens, Lalbagh, Bangalore, besides the visits to neighbouring villages for rural enquiry. The students of second year went to Tiruchirappalli, Agricultural Research Station, and Banana Research Station, Aduthurai, Agricultural Research Station, Kovilpatti, Sewage Farm, Madurai, Pandyarajapuram Sugar Factory, Pallapatti, Gandhigram and Cigar Factory at Ambathurai (Dindigul).

(*f*) *Examinations.*—All the candidates were sent up for the University Examinations as their performance was satisfactory. The University examinations for the First Year B.Sc. (Ag.) under the revised regulations were conducted during the third week of March 1954 while the Second and Final examinations were held in April 1954. Details of the results of these examinations are furnished under :—

Examination.	Number of candidates registered for examination.	Number of successful candidates.	Percentage of pass.
(1)	(2)	(3)	(4)
First Examination B.Sc., under (Revised Regulations)	99	78	78·8
Second Examination B.Sc. (Ag.) (Old Regulations)	93	71	76·3
Final Examination B.Sc. (Ag.) (Old Regulations)	76	61	80·3

NOTE.—Figures furnished in column (2) in respect of the Second and Final Examinations included the candidates who sat for the reference subjects.

(*g*) *Revised Regulations.*—The batch of students admitted during the year took the examinations in the month of March under revised regulations prescribed by the University.

(*h*) *College Hostel.*—The College Hostel remained under the control of the Principal as officio Warden assisted by a Senior Deputy Warden and a Junior Deputy Warden.

Three messes—one vegetarian and two non-vegetarian were run during the year under report. The average strength in each mess and the average daily rate of each mess during the period under review are furnished below :—

	Average daily attendance.	Average daily rate.
		Rs. A. P.
Vegetarian section	68	1 5 11
Non-Vegetarian section	66	1 6 7

During the year under review the system of bulk purchase and issue of main commodities to several messes was arranged. All possible efforts were taken to bring down the daily rate. The Canteen continued to meet the requirements of the students for stationery and other consumer's goods.

The general health of the inmates of the Hostel remained normal throughout the year. The students evinced interest in gardening and planted ornamental shrubs in front of their blocks. The frontage of the messes is being developed as small gardens.

(*i*) *Students' Club.*—During the year, three general body meetings and six ordinary meetings were conducted. All the trainees in Horticulture and Young Farmers enrolled as members of the Club. An individual cup was awarded to a member as the second best actor in Inter-Collegiate Dramatic Competition. The college won the Championship cup in the Coimbatore Inter-Collegiate Debating Competition. The Social Service League ran a night school, attended to the amenities of scavenger colony, laid road, dug drainage channel and constructed huts for a labour colony; the volunteer corps did good service during all major celebrations; a Hiking Party was organized and functioned well; the college shared the athletic honours with Government Arts College in the University Sports and broke as many as six records during the College Day Sports Meet. The Club Day was presided over by Sri M. Bhaktavatsalam, Minister for Agriculture, Madras. The lighting and entertainment arranged on this festive occasion were very much appreciated. The students staged a benefit performance to collect funds and make up its deficit.

Visitors.—The following are important visitors who evinced great interest in the work of the Agricultural College and Research Institute and the activities of the Madras Agricultural Department :—

(1) Sri M. Bhaktavatsalam, Minister for Agriculture, Madras.

(2) Sri M. V. Krishnappa, Deputy Minister for Food and Agriculture, Government of India.

(3) Sri Ananthasayanam Iyengar, Deputy Speaker of the Parliament.

(4) Sri R. K. Sanders, Head of the Research Department of the Metal Box Co., Ltd., England.

(5) Sri K. G. Sivaswami, Research Associate of Delhi University School of Economics.

(6) Srimathi Kaminidevi, daughter-in-law of His Excellency the Governor of Madras.

(7) Dr. B. H. Krishna, Director, Food Technological Institute, Mysore.

(8) Sri W. R. S. Sattianathan, I.C.S., Commissioner, Land Revenue, Madras.

(9) Sri A. Bheemappa Naik, B.A., Member of Legislative Assembly, Mysore.

(10) Dr. Sadagopal, D.SC., F.R.I.C., F.R.H.S., F.C.S., Senior Research Officer, Forest Research Institute, Dehradun.

(11) Dr. N. Parthasarathy, Director, Central Rice Research Institute, Cuttack.

(12) Sri K. Ramiah, Rice Expert, F.A.O.

IV. SPECIAL FEATURES OF THE YEAR.

National Extension Service in Tanjore district.—Government ordered that the National Extension Service Scheme should be introduced in all the villages of two out of the six revenue divisions of Tanjore district, viz., Mayuram and Kumbakonam. This was given effect to in May 1954. The object was among other things to increase the expectable surplus of the district by 75,000 tons of rice. The staff were intensified by appointing a District Agricultural Officer to each division of two taluks and an Agricultural Demonstrator to every firka instead of a taluk.

It is intended that the scheme should be introduced in all the villages in the other four divisions also successively as soon as the required trained personnel necessary for implementing the scheme in those divisions become available.

2. *Modified Japanese method of cultivation.*—The Japanese method of rice cultivation has been introduced in India from March 1953. This method has been modified to suit the Madras conditions. This modified method is

becoming very popular in all the 17 districts of the State, as it is based on the Agricultural Improvements of the department over 40 years of research and application. The area actually under the modified Japanese method of cultivation under paddy during 1953–54 was 13,785 acres. The average yield per acre in the treatment plots in pounds in paddy during 1953–54 is 3,990 lb. and the average yield of control plot per acre is 2,836 lb.

The following publicity materials were supplied to thist Sate by the Government of India :—

Flannel graphs	300
Flip books (*English*)	1,000
Flip books (Hindi)	1,000
Blank posters	20,000
Pamphlets (English)	100
Film on Japanese method	1

In addition to this 14 paddy weeders were also received. The film on Japanese method was tried in Madras and it was not found suitable to local conditions. Apart from this, leaflets on modified Japanese methods of cultivation were also printed at the Government Press, in regional languages and 30,000 copies in Tamil, 6,000 copies in Malayalam and 6,000 copies in Kannada were distributed to farmers through the district staff.

The modified Japanese method is proposed to be extended to millets cotton, coconut and sugarcane during 1954–55. Necessary steps are being taken to prepare propaganda leaflets, etc.

3. *Crop yield competitions.*—Crop yield competition in paddy which was popular was continued during the year. Competitions for crops like, jowar and bajra were also held. A separate scheme for crop competition for sugarcane was also run. A scheme for conducting crop competition for groundnut is under consideration.

The District prizes are being awarded and the State prize is yet to be awarded.

4. *Green and green leaf manure.—Indigofera Teysmanii*, a leguminous plant, introduced some time back from Ceylon is being multiplied in the Agricultural Research Stations in the State as well as in the districts. This is another green manure plant which has vast potentialities. The area under Sesbania as a line crop for manure and seed reached a record of 9 lakhs of acres this year. About three million plants of *Gliricidia maculata* were established this year in the State and a special drive given for this in the 'Glyricidia Week' organized in October. This is a permanent quick growing plant, which gives as lopping plenty of green leaf and lasts for over twenty years.

5. *Increased admissions to the Agricultural College, Coimbatore.*—The number of new admission to the Agricultural College, Coimbatore, was increased from 96 to 108 in 1954 to cope with the increased demand for admissions and to meet the shortage of qualified personnel required for operating the schemes under the Five-Year Plan.

6. *Weekly forecast reports on outbreak of pest and diseases of crops.*—To help the Plant Protection Staff in the control of pests and diseases a new and unique feature of the year is the issue of weekly forecast reports. Based on reports of pests and diseases from the districts the Government Mycologists, and Government Entomologist prepare every week a forecast of pests and diseases and likely incidence and these reports are transmitted to the Director of Information and Publicity and the Station Directors, All-India Radio, Tiruchirappalli, Madras and Kozhikode, for giving wide publicity and copies of these reports are being sent to the District Agricultural Officers to enable the ryots to take prompt action against the pests and diseases of crops.

7. *Prosopis Juliflora.*—Special drive was given during the year for large scale sowing of *Prosopis Juliflora* a hardy quick growing tree useful for hedges, fences, soil conservation, wind breaks, timber and fuel. A large quantity of seed was procured for distribution to ryots for fencing and for growing in waste lands. Road margins and along railway lines were specially tackled in co-operation with other departments and the following are the details of achievement :—

	LB.
(1) Quantity of seed distributed to ryots—	
Seeds	21,949
Pods	2,136
(2) Quantity of seed distributed to others—	
Seeds	5,071
Pods	588

(3) Mileage covered along road and rail sides—6,787 miles.
(4) Mileage covered along railway lines—1,602 miles.
(5) Area covered as fencing or paddock—25,883 acres.

The area covered by prosopis is the highest recorded over all the previous years.

Reduction in expenditure and increase in income in the Agricultural Research Stations.—As there is a general feeling among the public that the Agricultural Research Stations run by Government are run at enormous cost irrespective of receipts realized from them, a drive was launched since 1951 towards, economising working expenses of Government stations and increasing their receipts. The main lines pursued were (1) making Farm self-sufficient in their requirements of organic manures, (2) improving irrigation facilities, (3) raising live fences, (4) maximising use of available land, (5) economising labour employed by fixing a range for labour required for different operations and (6) raising the efficiency of management by prescribing a questionnaire for inspection. The progress of expenditure and receipts of Farms was also watched in periodical returns. The results of the drive have shown that it is possible to run Agricultural Research Stations on a self-supporting basis although some Agricultural Research Stations have yet to make headway in this respect (vide Statement of Receipts and Expenditure for the financial years 1952–53 and 1953–54 given in Appendix). On the whole there has been a reduction in expenditure by Rs. 68,630 and an increase in receipts by Rs. 1,22,516 or a net saving of Rs. 1,91,140. This is due to the greater income from increased production and saving in the manure bill by expansion of green manures and composts.

V. SEASON.

North-east monsoon period.—The commencement of the north-east monsoon was good. Practically throughout the States, rains were above normal in October 1953. Conditions became a bit adverse in November, with the rains subnormal. In December also, no considerable improvement was felt. In respect of total rainfall in the north-east monsoon period—October to December—the districts of Chingleput, North Arcot, South Arcot, Tanjore and South Malabar had poor rains ; South Arcot district was worst hit.

Agriculturally the north-east monsoon distribution was fairly favourable for crop production. But conditions were highly favourable for the incidence of pests and diseases on crops, particularly paddy in many districts as Chingleput, North Arcot, and South Arcot. In South Kanara district paddy had a number of pests due to inadequacy of water in this period. Potato in Nilgiris district had diseases in October due to the partial failure of the north-east monsoon rains.

Dry weather period.—The year 1954 commenced well. The rains in January were above normal almost throughout the State. Chingleput, South Arcot, Tanjore, Coimbatore, Madurai, Tirunelveli and Nilgiris districts had very good rains. In the month of February rains were subnormal throughout the State. In March conditions improved considerably throughout the state with the solitary exception of Chingleput district.

The total effect of the rains in the dry weather period was fairly favourable to ryots. Water position in the wells and freshes brought in the tanks gave fresh hopes to ryots. Garden land cultivation was pushed through and preparatory cultivation in the dry lands was also taken up.

Hot weather period.—The rains received in the month of April were far above normal, particularly in Coimbatore, Ramanathapuram, Malabar and South Kanara districts. Pattukkottai area of the Tanjore district received good rains. The remaining portion of the State received fairly normal rains except the Nilgiris district. In May the position became slightly adverse throughout the State except in Coimbatore and Madurai districts. Agriculturally the season was favourable and preparatory cultivation was attended to. Water position was fairly satisfactory. The summer showers did good to the dry crops. In fact the good hope that the ryots had at the beginning of the year was maintained in the same encouraging state in the first five months of year 1954.

South-west monsoon in 1954.—The setting in of the monsoon was normal on the West Coast. To start with, the monsoon was good, but its subsequent development was not very satisfactory. In fact throughout the State, adequate monsoon rains were awaited with anxiety. In the West Coast the rains were above normal.

On the whole, the year 1953 broke the long chain of six years of failure of both the monsoons. Conditions improved considerably throughout the State. Scarcity of water for irrigation was not so keenly felt as in the past six years. To add to that there was no severe widespread weather-extremes like cyclones to cause appreciable damage to crops. Agriculturally the seasons in 1953 was good and in certain areas the crops really gave bumper yields.

The first half of the year 1954 seems to have kept up the encouraging hope which the ryots got in 1953. Due to favourable showers, all the agricultural operations went on fairly in a normal manner practically throughout the State. But the month of June 1954 caused anxiety due to the absence of adequate early monsoon showers (vide rainfall statement Appendix). On the whole the year was very favourable for crops, and according to the third and final forecast the paddy area increased from 5·7 last year to 6·4 million acres and the production of rice from 2·16 to 2·98 million tons. The season also helped the intensive food production drive and 90 per cent of the target was achieved.

VI. FIVE-YEAR PLAN.

Intensive Cultivation Schemes.

The year under report is the third year of operation of the intensive cultivation schemes under the Five-Year National Plan.

The following schemes were continued :—

I. Land Development schemes—
- (*a*) Reclamation of waste lands and old fallow with tractors.
- (*b*) Soil conservation.

II. Irrigation Schemes—
- (*a*) Oil engines and electric motors on hire and on hire-purchase.
- (*b*) River pumping schemes.
- (*c*) Filter point tube wells.

III. Distribution of fertilisers—
- (*a*) Ammonium sulphate.
- (*b*) Superphosphate.

IV. Distribution of manures—
- (*a*) Rural compost.
- (*b*) Urban compost.
- (*c*) Green manures.

V. Distribution of improved seeds—
- (*a*) Paddy.
- (*b*) Millets.
- (*c*) Pulses.

VI. Control of pests and diseases of crops.

I. *Land Development schemes—(a) Reclamation of waste lands with tractors.*—Reclamation of waste lands and old fallows to increase the area under cultivation at a moderate cost and with speed, is done with tractors and bulldozers. The tractors were also used for ploughing regularly and for puddling operations in wet lands. Bulldozers were used not only for clearing and levelling virgin waste lands but also for restoring sand-cast areas and silted tanks. Tractors and bulldozers are now used in soil conservation work in Nilgiris also. There were 85 tractors and another 74 with bulldozers in the Residuary State and an area of 16,635 acres tackled leading to a production of 1,481 tons of foodgrains.

To enable enterprising and progressive agriculturists to own their tractors for cultivation the scheme of hire-purchase system was also continued to operate. Twenty-three tractors with matched implements were supplied under the scheme. They were put to good use and it is estimated that 9,200 acres have been tackled by these.

(*b*) *Soil conservation.*—No large scale progress was made in soil conservation work but a pilot scheme was in operation over an area of 88·65 acres in Ketti Valley in the Nilgiris. The protected areas gave over 40 per cent increased yield in potatoes grown therein as compared to crops in the unprotected areas. The area will be increased to 203·25 acres lying contiguous to the Pilot scheme area. Soil conservation work started in Dharapuram taluk as a famine relief measure was continued and about 708 acres were contour bunded during the year bringing the total area contour bunded to 6,000 acres. Two more schemes for soil conservations have been sanctioned for the district.

about 66,951 tons of ammonium sulphate was distributed as compared to about 45,879 tons last year, i.e., 1952–53.

Total loan amount allotted (Residuary State only)—Rs. 62,10,000.

Amount actually disbursed—Rs. 56,69,117.

Estimated additional rice production—133,902 tons.

Total areas covered—1,874,628 acres.

Intensive Manuring Scheme—Loan amount disbursed—

(1) Composite State (1st July to 30th September 1953)—Rs. 1,03,73,289.

(2) Residuary State (1st October 1953 to 30th March 1954)—Rs. 26,72,751.

(3) Residuary State (June 1953 to July 1954)—Rs. 58,47,957.

IV. (*a*) *Rural compost-making from waste vegetable matter.*—In G.O. Ms. No. 235, Agriculture (Food Production), dated 29th May 1953, Government ordered that the compost week should be celebrated along with the National Tree-planting week (Vanamahotsava). Accordingly Compost week was celebrated in all the districts of this State in the first week of July 1953 in co-operation with the officers of the Revenue, Agriculture and National Extension Scheme. Meetings were also held in different villages and the ryots were impressed on the necessity of preparing compost. Actual demonstrations of digging pits and preparation of composts were conducted wherever possible. Wide publicity was given regarding the award of certificates of merits to those who prepare the maximum compost. Their names were published in the Villagers' Guide and Calendar and the Grow More Food Journals.

No subsidy is granted for compost-making from June 1952. The quantity of rural compost prepared during the period under report is 164,590 tons.

(*b*) *Urban compost.*—The Urban Compost Scheme continued to be in operation under the Inspector of Municipal Councils and Local Boards.

Expansion of the compost work.—After the partition of the Andhra State, out of only 61 municipalities in this State 60 municipalities are making compost. There were 290 notified panchayats (having Executive Officers) in this State at the end of June 1954; out of them 240 panchayats (having Executive Officers) have started compost manufacture. In addition to these notified panchayats 70 non-notified panchayats which have scavenging facilities were manufacturing compost at the end of June 1954. A statement showing the compost manufacture during the period from 1st October 1953 to 30th June 1954 is given in Appendix No. 2. The target fixed for the year 1953–54 for the Madras is 267,200 tons against which 251,396 tons of compost were prepared during the year and 207,878 tons sold.

Disposal of compost.—Government have permitted the sale of compost manure by public auction by the Madurai Municipality, Kadayanallur Panchayat and Mangalore Municipality.

Celebration of Compost week and Tree-planting week during 1954.—Instructions have already been issued to all the Executive Authorities of the local bodies to celebrate the Compost and Tree-planting week in July 1954 as usual. A consolidated report on the celebration of the week is awaited from the Regional Inspectors.

Preparation of blood meal.—The Commissioner, Palayamkottai Municipality, has reported that arrangements are being made for commencing the preparation of blood meal soon.

Subsidy for compost.—During the period under review a sum of Rs. 93,230–0–3 was sanctioned to some local bodies as subsidy towards the loss incurred by them on the sale of compost for the years 1947–48, 1949–50 and 1950–51. In addition to it a sum of Rs. 16,383–2–0 was also sanctioned as subsidy to some local bodies and an amount of Rs. 5,178–2–0 to some co-operative societies towards the loss incurred by them on the sale of compost during the year 1948–49.

Government have since issued orders in G.O. Ms. No. 65, Agriculture (Food Production), dated 4th March 1954, permitting the local bodies to fix the sale price of the compost manure, but no subsidy will be sanctioned by Government to cover any loss incurred by the local bodies in this regard.

(*c*) *Green manure seed distribution.*—Green manuring of paddy is an important improvement in maintaining and raising the crop producing capacity of the soil. At a time when there is shortage of food especially rice, manuring with green leaves ranks foremost in the programme of the department. The green manure crop has to be raised in the off-season after paddy harvest (i.e.) February-March or May-June. At this time the irrigation canals will be closed and hence the crop will have to depend on rain. The crop has also to be protected against cattle trespass. To overcome these difficulties *Sesbania speciosa* a quick growing, cheap, leguminous green manure crop, producing abundant foliage, successfully multiplied during the past two years, has been extensively grown during the year. This green manure crop is similar to Daincha in respect of soil requirements but yield of green matter is much higher.

The department has evolved a new and cheap method of growing it in lines in paddy fields by transplanting seedlings with paddy along the margins, occupying no extra area of cultivable lands. In extensive rice areas like Tanjore, *Sesbania speciosa* grown on paddy field bunds of the first crop kuruvai paddy yielded up to 6,000 pounds of green leaf to manure the second crop. Besides as a pure crop, *Sesbania* yields about 60,000 lb. of green leaf per acre, enough to manure 10 acres of paddy lands. This method is also becoming popular and about 5,000 acres even so grown with *Sesbania* during the period to manure 50,000 acres of paddy.

During the period under report a quantity of about 150½ tons of *Sesbania speciosa* was sold to the ryots.

Besides *Sesbania speciosa* small quantities of other green manure seeds like Daincha, Kolingi, Sunnhemp, Pillipesara, etc., were also sold to the ryots.

Indigofera Teysmanii, a perennial green leaf yielding shrub, was found very promising in Malabar and Tanjore districts. It stands lopping and yields a good quantity of green leaf. It was observed to grow as much as six feet tall in about five months thus growing beyond a height which the goat can reach and brouse. This plant is prolific in seed production. A fair quantity of seed has been collected and distributed for expansion to ryots.

The progress of work done on planting of *Sesbania* as border crop and *Glyricidia* in field bunds in the Residuary State is as follows, during the past two years:—

	1952–53. ACS.	1953–54. ACS.
Sesbania	202,088	905,158
Glyricidia	12,620	29,133

Government sanctioned the continuance of the scheme for the award of prizes and rolling crops for intensifying the cultivation of green manure trees

II. *Irrigation schemes—(a) Oil engines and electric motors for hire and hire-purchase system.*—As there was great scope for power lift irrigation the department was stocking power pumping sets for the hire especially to small agriculturists. The department had 440 sets available for hiring after the separation of the State. There was very heavy demand for oil engine pumpsets.

To help poor and deserving ryots to have their own power pumping sets the scheme of supply of oil engine and electric motor pumpsets on hire-purchase system was conttnued up to 30th June 1954 and so far the following units were acquired for the Residuary State under the scheme :—

Oil engines—1,576.
Electric motors—424.

The scheme commanded a wide response and is making steady progress.

(*b*) *River pumping schemes.*—The object of the scheme is to provide irrigation facilities through big pumping units to a group of ryots n a suitable village by lifting water from rivers, for areas which cannot be irrigated by gravity flow. The river pumping units in Pinayur and Nelvoy in Chingleput district were continued. The schemes in South Kanara were closed. The river pumping scheme sanctioned at Lakkidiperur and Lakkidipallapuram in Walluvanad taluk in Malabar were started. The scheme at Kilithur in Tanjore district was continued and another at Talengeri in Mayavaram taluk was started for raising early crops.

(*e*) *Filter point tube well scheme.*—The scheme for sinking 400 filter point tube wells for the Residuary State in 1953–54 was sanctioned in January 1954 with a loan of 11·14 lakhs by the Government of India. The target could not only be completed by June 1954 but was even exceeded in most of the districts and 525 filter points were sunk successfully. About 5,250 acres are expected to be covered by irrigation by these filter points and an addition yield of 2,625 tons may be estimated. The work was beneficial to ryots for raising short crops in summer and ascelition (crops) as supply of water was made available throughout the year.

More details on these engineering schemes are furnished in section 1 on Agricultural Engineering.

III. *Distribution of chemical manures—(a) Superphosphate.*—The supply of superphosphate was decontrolled with effect from 15th August 1952 and since this date, this department has not purchased any quantity of superphosphate from the manufacturing firms. The small residuary quantity of superphosphate available in the agricultural depots is being disposed of by sale to ryots.

(*b*) *Ammonium sulphate.*—From 1950 up to 20th September 1953 this department was functionong as a wholesale distributor by supplying stock of ammonium sulphate from the Central Fertiliser Pool to retail distributing agencies, i.e., co-operative societies and tender firms on 50 : 50 basis. This was discontinued from 21st September 1953. Direct retail distribution of ammonium sulphate by this department was allowed on pre-payment of cost. Besides the sale of ammonium sulphate was thrown open to normal trade. Under this arrangement the dealers and co-operatives got their requirements from clearing and forwarding agents at Madras Port. The stocks left with the agricultural depots were also being sold to the dealers or ryots without any quantitative limit.

From April 1954, the direction, control and supervision of the distribution of ammonium sulphate are with the Board of Revenue and Collectors in the districts. Under the new set-up, the District Co-operative Wholesale Stores have been ordered to act as Government stockist on an agency basis.

For each taluk in the district the concerned district Collector has appointed two wholesalers-*cum*-retailers (one co-operative organization and the other a private merchant). The wholesalers-*cum*-retailers will obtain stock from the Government stockist of their district duly remitting the cost into the treasury and distribute to the ryots. The retail selling price to the ryots is Rs. 350–6–3 inclusive of sales tax.

During the period 1st October 1953 to 31st March 1954, a quantity of 44,330 tons of ammonium sulphate has been distributed in Madras State of which 8,614 tons have been distributed to manure mixing firms. A quantity of 1,374 tons of superphosphate was distributed during the period from 1st October 1953 to 31st March 1954 out of the stock available with the agricultural depots.

Under the revised arrangements from 1st April 1954 the Board of Revenue have arranged supply of 12,924 tons of ammonium sulphate from Sindhri Fertilisers and Chemicals, Limited, Sindhri, to the Co-operative Wholesale Stores in the districts. The supply of ammonium sulphate to ryots in the Madras Residuary State reached a record in 1953–54 of 66,951 tons and helped substantially in increasing food production.

Intensive Manuring Scheme, 1953.—In G.O. Ms. No. 155, Food and Agriculture (Food Production), dated 16th April 1953, Government sanctioned the continuance of the Intensive Manuring Scheme for the year 1953–54 also. The scheme was in operation from 1st May to 31st October 1953 and in certain districts from 1st July to 31st December 1953. The scheme with a target of 1·25 crores of rupees was sanctioned and implemented in the whole Composite State. Out of 1·25 crores allotted by Government for the entire Composite State the Residuary State of Madras got Rs. 52,30,000 Afterwards due to the large demand for manures all over the allotment was increased to Rs. 62,10,000.

In this year, unlike the previous years, the monsoon rains were favourable and the water in almost all the lakes in this State reached full level. Consequently full supplies of water available even early in the season and the area cultivated during the year is estimated to be normal. Special staff was also sanctioned for the scheme. The special staff since the inception of the scheme were busy doing propaganda for application of chemical fertilisers to increase the yield of paddy and were canvassing loan applications. The favourable seasonal conditions were conducive for a good response from mirasdars. Besides, the increased rate of loan to Rs. 35 per acre and the increase of maximum from Rs. 200 to Rs. 500 per individual had helped in greater manuring of fields. The ryots have become more manure minded than they were some years back. The scheme is mainly intended for the paddy crops with assured water-supply. The loans are given only in the shape of chemical manures. The object of the scheme is to encourage the ryots to produce more paddy by applying these chemical manures. The loan will be recovered after the long term harvest along with the kist. The scheme will facilitate the poor ryots to purchase the manures on loan basis and use the same in their lands.

The continuation of credit facilities especially in the case of ryots with small holdings has helped in encouraging the use of chemical fertilisers for the increased food production and reduce the rice deficit in this State.

The following are the loan amounts allotted disbursed and the estimated additional production in this State under the scheme. During 1953–54

and shrubs up to the end of 1953–54 and in G.O. Ms. No. 336, Food and Agriculture (Food Production), dated 19th August 1953. Sanction for further continuance of the scheme for 1954–55 has been accorded in G.O. No. 289, Agriculture (Food Production), dated 20th September 1954.

V. *Distribution of improved seeds*—(*a*) *Paddy.*—This item of work is given a high place in the grow more food campaign. The increase in yield on account of the utilization of improved seeds is estimated at 10 to 15 per cent over the local seeds. The department has evolved about hundred improved strains of paddy suited for different local conditions and seasons in the residuary State. Some of these are cosmopolitan strains. Strains largely in demand are multiplied and distributed to farmers so that they could sow pure improved strains and step up food production. The improved strains produced in the Agricultural Research Stations are first multiplied in ' Primary ' and then in ' Secondary ' seed farms in ryots' holdings. Expenditure on supervision of seed farm roguing charges and premium to seed farm ryots is met by the Government. Seeds procured from secondary seed farms are stocked in several departmental depots for general distribution to ryots. 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. Half the premium paid to the seed farm ryot is recovered through sales and the balance subsidized by Government.

The scheme for the distribution of improved seeds through village co-operatives was in operation in the districts of Tirunelveli, Madurai, Coimbatore, Tanjore, Tiruchirappalli, South Arcot, South Kanara and Malabar.

The system of seed exchange by which ordinary varieties are exchanged for improved seeds was discontinued in G.O. Ms. No. 25, Agriculture (Food Production), dated 25th January 1954.

An improved method of seed distribution was introduced this year for paddy and millets for the spread of improved strains in each village as a self-contained unit. According to this scheme, primary seeds will be distributed to the villages at the rate of one pound per acre to selected ryots through village agricultural associations for further multiplication. These selected ryots should be prominent persons interested in developing agriculture and having considerable influence in the locality. These selected ryots will be entrusted with the multiplication of seed carefully. These will be called '*Village seed farms*'. All the seeds from the village seed farms will be distributed to the ryots of the village. The aim is to cover the entire village as quickly as possible. This method will not only save the large labour and expense of procuring from secondary seed farms but will also have the advantage of covering the entire village in a short time. This scheme is being introduced in a large number of villages in 1954–55.

During the period the following seed farms were raised under paddy :—

Primary—2,738 acres.
Secondary—6,659 acres.

A quantity of 1,091 tons of paddy was procured and a quantity of 1,3[illegible] tons of paddy was distributed during the period. This covered an area of about 62,775 acres estimated to give an additional production of 4,204 tons of rice and the economic gain to the State was estimated to be Rs. 14,71,400.

(*b*) *Distribution of improved millet seeds.*—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 period :—

Millets—
Primary—911 acres.
Secondary—1,369 acres.

A quantity of 17½ tons of improved millet seeds was procured and a quantity of 47 tons was distributed during the period. This covered an area of of about 7,050 acres estimated to give an additional production of 401 tons and the economic gain to the State was estimated to be Rs. 1,68,420.

(*c*) *Distribution of improved strains of pulses.*—Seed farms as shown below were run during the period :—

Primary—14 acres.
Secondary—13 acres.

A quantity of 210 lb. was distributed during the period.

Procurement of improved seeds was made on a restricted scale in view of the fluctuations in market trends so as to avoid accumulation of stocks and consequent loss to Government.

Area under improved strains of paddy, millets and pulses.—The strains introduced by the department have spread to ryots over large areas by natural spread. The area so far covered from reports of Crop Specialists and District staff, were as follows :—

	Total area.	Area under improved strains. (Lakhs of acres.)	Per cent.
Paddy..	58·2	25·7	44·1
Millets	44·5	7·9	17·7
Redgram	1·5	0·1	6·8

Crop yield competition fortnight.—The crop yield competition fortnight was celebrated in all districts from 1st to 14th June 1954 to bring about improvement in farming practices. Prizes to winners of crop yield competitions were distributed by high officials and personages. Meetings were held and the object of the competitions were explained to the ryots. Intensive propaganda was done to enlist a large number of competitors.

During the fortnight 1,897 competitors were enlisted.

VI. *Control of pests and diseases of crops—(plant protection service).*—The scheme of plant protection was continued in the residuary State with two plant protection officers, one for Mycology and one for Entomology at Coimbatore and with two corresponding Plant Protection Assistants for each of the districts. Insecticides and fungicides for sale to ryots and sprayers and dusters for application of pesticides were stocked in all Agricultural depots. Insecticides and fungicides were on sale at 75 per cent of their cost in general. The demand from ryots for help increased considerably this year and a large quantity of pesticides and insecticides sold and assistance rendered over a wide area, as incidence particularly of insects was severe in many districts this year.

Paddy jassids and fulgorids did appreciable damage to the paddy crop in Tanjore, Pattukkottai, North Arcot, Chingleput and Tirunelveli districts. To help the ryots in North Arcot, Chingleput, Madurai and Tirunelveli districts, insecticides were ordered to be sold at 50 per cent of their cost. This enabled wider control of the pests. In other districts intense remedial measures were taken against the pests on appearance. In South Kanara district where the Army worm of paddy assume pest form, the Agriculturist Pests and Diseases Act was applied. Stem borers, rice bug,

grasshoppers, hispa and rats were the other pests of paddy attended to. Among the pests of other crops remedied were the earhead bug and white stem-borer of cholam, the cut worm and flea beetle of ragi and several kinds vegetable pests, citrus and grape vine pests. Groundnut, sugarcane and cotton pests were tackled for control. Biological control measures were adopted against the coconut black-headed caterpillar pest by rearing and and liberating 48,000 parasites in the districts of South Kanara and Malabar. A swarm of migratory locusts flew over in a westerly direction in Ramanathapuram district. This occurrence is unusual in South India and preparations were made to tackle the swarm which however seems to have moved away without settling down anywhere in the south.

In the case of fungoid diseases, the plant protection staff dealt with localized case of blast, stem rot. and Helminthosporium on paddy, fruit rot of chillies, betel vine wilt, canker, die back and mottle leaf of citrus and mildew on grapes. Seed treatment of paddy and cholam was carried out on a large scale and has become popular. During the year 1953–54 seed treatment against diseases was done to cover 50,035 acres under paddy and 23,915 acres under cholam or a total of 73,950 acres.

In the period under report, 196,529 acres of food crops, 21,217 acres of other crops and 319,890 fruit and other economic plants have been protected from pests and diseases and due to the timely action it has been estimated that about 16,255 tons of foodgrains have been saved from loss through the plant protection service.

For the year ending 1953–54 the area treated through the plant protection staff in the campaign against pests and diseases was as follows :—

Area treated in acres.

Crops.	Pests.	Diseases.	Total.
Paddy	159,039	57,171	216,210
Other foodgrains ..	8,434	25,259	33,693
Other crops	31,901	16,191	48,092
Total ..	199,374	98,621	297,995

The saving in foodgrains alone is estimated at 19,000 tons. Besides blast resistant varieties are estimated to have spread over 3 lakhs acres of paddy and given an additional production of 21,400 tons.

Total effect of intensive cultivation schemes.—As a result of working the intensive cultivation schemes under the control of the Agricultural Department it is estimated that an additional production of 231,420 tons of foodgrains has been achieved or 90 per cent of the target of 256,693 tons due to a good season. The details are given below :—

Intensive cultivation schemes for the fasli year 1953–54.

Particulars of the scheme.	Quantity or number distributed.	Estimated area covered (acres).	Estimated additional production (tons).	Target for 1953-54 (tons).	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
Land reclamation by tractors and bull-dozers—					
Hire system	74 units	22,696	2,138	4,150	
Hire-purchase system	13 „	5,200	1,300	2,300	Ten units released during the year against allotment of previous year.
Supply of oil engines—					
Hire system		..	..	80	No units were purchased.

Particulars of the scheme.	Quantity of number distributed.	Estimated area covered (acres).	Estimated additional production (tons).	Target for 1953-54 (tons).	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
Supply of oil engines and electric motor pumpsets—					
Hire-purchase system—					
O.E.	5	40	60	3,246	
E.M.	16	80			
River pumping scheme.	6 Nos. (Includes 4 nos. of previous years).	515	258	266	
Filter point tube wells.	583 nos.	5,830	2,915	2,000	
Distribution of chemical fertilizers—Ammonium sulphate.	66,951 tons.	1,874,628 Acreage merged with ammonium sulphate.	133,902	111,200	
Super	4,289 „		3,574		
Distribution of green manure seeds—					
Sesbania	191 tons.	905,158	80,818	100,636	
Distribution of improved seeds of—					
Paddy	2,477 tons.	111,472	5,972	22,333	*
Millets	56 „	8,445	481	10,261	
Pulses	435 lb.	58	2	222	
	..	..	231,420	256,694	

* Procurement was made on a restricted scale on account of fluctuations in market price in order to avoid stagnation of stocks and resultant loss to Government by fall of prices.

VII. COMMUNITY PROJECTS.

The Community Development Programme are in operation in the Madras State in four Community Development Blocks launched in the year 1953–54 and in four Community Projects launched during 1952–53.

The following are the details :—

Name of the project.	Details of the area.	Headquarters.	Number of villages.	Area in square miles.	Population.
	Community Project set up in 1952–53.				
1 Lower Bhavani Project.	Parts of Gobichettipalayam, Erode, Bhavani and Dharapuram taluks in Coimbatore district and three villages in Karur taluk in Tiruchirappalli district.	Erode ..	187	701·3	562,996
2 Malampuzha Project.	Palghat taluk in Malabar district.	Palghat ..	113	643·2	598;410
3 Periyar Project.	Parts of Melur, Nilakottai and Madurai taluks in Madurai district.	Gandhigram.	306	494·3	395;993
4 South Kanara Project.	Karkal and Mangalore taluks and part of Coondapur taluk in South Kanara district.	Mangalore.	302	1247·7	618,152
			908	3,086·5	2,175,351
	Community Development Blocks set up in 1953–54.				
1 South Arcot district.	A portion of Chidambaram taluk round Sethiatope excluding the urban area of Chidambaram.	Chidambaram.	123	150·30	95,253

Name of the project.	Details of the area.	Headquarters.	Number of villages.	Area in square miles.	Population.
2 Chingleput district.	A portion of Chingleput district.	Tirukkalikundram.	115	153·82	80,993
3 Tirunelveli district.	A portion of Ambasamudram.	Cheranmahadevi.	55	121·12	102,825
4 Madurai district.	A portion of Dindigul taluk.	Gandhigram.	18	82·81	89,285
		Total ..	311	508·05	368,356

A brief account of work done by the Agricultural Department is given below :—

Malampuzha Project.—Roughly 129,000 acres of land are under paddy cultivation in this area ; 440 tons compost were manufactured and 653 tons of chemical fertilizers were distributed. Four hundred and ninety-five demonstration farms were started, 11 pumps sets were supplied. An area of 3,500 acres was brought under improved seeds and 10,850 acres under green manure, chiefly *Sesbania*. A sum of Rs. 1,37,150 was distributed as short-term loans.

South Kanara Project.—Progress in agriculture has been achieved by spreading improved seeds, increasing the extent manured with fertilizers and green manures and popularizing cultivation under new methods like modified Japanese method of cultivation, economic planting, etc., up to 30th September 1953, 3,764 acres have been covered with improved seeds and up to 30th June 1954, 5,068 acres. A total area of 46,000 acres has been manured with fertilizers. Short-term loans to the tune of Rs. 1,45,600 have been disbursed for the purchase of manures and seeds from August 1953 to June 1954. About 1,886 compost pits were dug by 30th September 1953 and by 30th June 1954 there were 5,069 pits producing 7,569 tons of compost manure. For popularizing green leaf manures 255 lb. of *Glyricidia* seeds and 50,000 seedlings were distributed in the villages covering an area of 1,976 acres. Similarly 500 pounds of *Sesbania* seeds and 3 lakhs of seedlings were distributed to cover 2,650 acres. Kolingi was grown *in situ* and an area of 610 acres manured. For the modified Japanese method of rice cultivation, 27 plots were selected for the first crop of 1953 and was extended to 160 acres covering 70 villages in the second-crop season. Supply of improved vegetable seeds and introduction of fodder grasses also received special attention. An area of 1,590 acres were tackled for pest control, resulting in a saving of 178 tons of rice. Regarding tree planting 2,000 mango grafts, 5,000 sapota and 6,000 coconuts seedlings were supplied to the ryots in the villages at concessional rates.

Lower Bhavani Project.—Over 4,345 compost pits have been laid and 6,518 tons of compost from last year's pits have already been used with satisfactory results. Besides 2,025 manure pits have been rectified and 4,163 pits newly dug up and 74,129 maunds of town compost were manufactured. A sum of Rs. 1,62,290 has been advanced to the ryots as short-term loans for purchase of seeds and manure. Four thousand four hundred and seventy-four maunds of improved seeds and 369,621 maunds of fertilizers including town compost and green manure have been distributed. Six hundred and twenty acres of lands were brought under modified Japanese method of cultivation.

Periyar Project.—An extent of 23·24 acres of lands was brought under the modified Japanese method of cultivation. 573·09 maunds of green manure seeds, 4,421 maunds of improved paddy seeds and millets, 79·16 maunds of other seeds and 68,375 maunds of fertilizers were distributed. About two million maunds of town compost were produced.

Similar work was done in the other four Community Development Blocks. Two thousand three hundred and eighty-two compost pits were dug. About 500 tons of fertilizers and 5,080 lb. of seeds were distributed. The modified Japanese method of cultivation was demonstrated in 18·15 acres in Chidambaram Block in 12 acres in Cheranmahadevi and in 5·7 acres in Tirukazhukundram Block.

The Project Executive Officers prepared programme of work in consultation with the Agricultural Department and these programmes of work approved by this department.

VIII. NATIONAL EXTENSION SERVICE.

In G.O. No. 1232, Agriculture, dated 15th April 1954, the Rural Reconstruction work has been merged with National Extension Service from December 1953, under the administrative control of the District Collectors assisted by the Block Development Officers and technical help is given by the officers of the Agricultural Department. Details of blocks, number of villages, area in square miles and population is furnished in Appendix 3.

Basic Agricultural Training Schools.—From 15th July 1954 Government have started six Basic Agricultural Training Schools in six places, attached to the existing agricultural farms in these areas excepting at Kallupatti and Bhavanisagar where new agricultural farms are being brought into existence. The schools are each capable of training fifty village level workers per annum so that they will turn out 300 village level workers every year. The training in these schools mentioned below extends over a period of twelve months in agricultural and allied practices and principles and will be followed by a further training in extension methods for a period of six months :—

Centre.	District.
1 Koilpatti	Tirunelveli.
2 Aduthurai	Tanjore.
3 Pattukkottai	Tanjore.
4 Taliparamba	Malabar.
5 Bhavanisagar	Coimbatore.
6 Kallupatti	Madurai.

Officers of the Agricultural Department are appointed as Principals of the Agricultural Schools, with necessary staff.

Tanjore Development Scheme.—In G.O. Ms. No. 1629, Agriculture, dated 15th May 1954, Government sanctioned the Tanjore Development Scheme and authorized the Collector of Tanjore to implement the National Extension Service Scheme in Tanjore district. The scheme has been introduced in two divisions, i.e., in Kumbakonam and Mayuram divisions, from May 1954 in the first instance.

The scheme seeks to bring out a durable organization of the village people in every village of the country, which would be adequate and suitable for the task of mobilizing local initiative and local resources to the utmost extent possible in order generally to raise the level of rural life and more particularly to develop agricultural production at a rate fast enough to assure to an increasing population progressively rising levels of nutrition.

The aim is to extend the area of operation of the scheme within every district of this State as rapidly as the requirements of training of personnel will permit. The arrangements for training of personnel will be so designed that it may prove to be possible to build up the organization of the National Extension Service and execute the constructive programme in all villages of this State before the end of the Second Five-Year Plan.

Proposals were sent by the Agricultural Department for intensive development of agriculture in the Tanjore extension area. In the original scheme proposals were submitted for having a District Agricultural Officer for every revenue division of the Tanjore, one Agricultural Demonstrator for every firka and a demonstration maistry for every 5,000 acres of paddy in Tanjore. The object among other agricultural improvements was to increase the exportable surplus of Tanjore district permanently by 75,000 tons of rice in the course of three years. This scheme was approved by Government, but effect was given to the scheme as a first step in the Revenue divisions of Kumbakonam and Mayuram only. The District Agricultural Officers and complementary staff have been posted to these areas and work is now started. The important features of the agricultural programme are the covering of the entire paddy area are under green manure (Sesbania) distribution of improved high yielding of blast resistant strains of paddy to all important villages and increased application of fertilizers so that the permanent level of production in Tanjore district is increased by 75,000 tons of rice annually in the course of three years. The necessary arrangements towards the first year of the programme were taken up in the course of the year.

National Extension Blocks.—Help was given to the Block Extension Officers for supply of improved strains of seeds, introduction of improved methods and plant protection in the 28 National Extension Blocks in the State. In G.O. No. 1232, Agriculture, dated 15th April 1954, Government ordered that one of the two depots in the National Extension Block areas in each district should be handed over to the Block Development Officers. Consequently the depots in Tiruppur, Srivilliputtur, Gangayapalli, Musiri, Tiruvallur, Tirumangalam, Ootacamund, Tiruturaipundi and Sankarankoil were handed over to the Block Development Officers and the agricultural staff of the depots are awaiting posting to new areas. In this connection a suggestion was made by Government to remove all the normal agricultural staff from the community and National Extension Blocks and re-align them in the rest of the area to provide normally a demonstrator for every two firkas. Proposals were submitted to Government for re-organization on the above lines, and orders are awaited and since received in November 1954. The main necessity on such re-organization is that the Block Development Officers and Project Executive Officers should be able to carry out the existing targets already being worked up in the food production and Five-Year Programmes. For this, technical control of the work in the blocks is essential to carry out the programme. Proposals for the control and supervision of the agricultural work and staff in the Community and National Extension areas have been submitted to Government.

IX. COTTON EXTENSION PLAN, 1953–54.

The Cotton Extension Scheme was commenced in June 1950 under the Integrated Production Plan of the Government of India. The scheme was included in the National Five-Year Plan from 1951–52 and the work reported was for the fourth year under the Cotton Extension Plan and third year under the National Five-Year Plan in the residuary Madras State.

Work done under the Cotton Extension Plan during 1953–54.—The different items of the Cotton Extension Plan approved and adopted for the Madras State for 1953–54 season are as follows :—

(i) Cultivation of cotton in newly reclaimed waste lands and fallow lands.

(ii) Extension of area by replacement of other non-food crops like groundnut.

(iii) Double cropping—cultivation of cotton in rice fallows.

(iv) Inter-cropping of cotton with—

(*a*) Unirrigated groundnut,

(*b*) irrigated groundnut and ragi,

(*c*) inter-crops in coconut topes, banana garden and other fruit gardens,

(v) Distribution of improved seeds.

(vi) Application of fertilizers.

(vii) Adoption of plant protection measures.

(viii) Improved cultivation methods.

Besides, Moco cotton was recommended to be grown as perennial plant in school gardens, house compounds, community protection areas, etc.

Procurement and distribution of improved seeds.—The improved varieties multiplied and distributed were Co. 2, M.C.U. 1, K. 2 and K. 5 and the particulars of the quantities procured and distributed to cultivators are furnished below along with the targets :—

TABLE I.

Procurement and distribution of improved seeds in 1953–54.

Variety.	Quantity targetted to be procured (maunds).	Quantity procured (maunds).	Quantity distributed to cultivator (maunds).
Co. 2	4,500	373	489
M.C.U. 1	15,000	13,429	19,331
K. 2	14,000	453	4,856
K. 5	7,000	4,517	1,871

In order to meet the requirement of seed of a short duration variety for double cropping and mixed cropping 1,360 maunds of P.216 F. seed was imported from East Punjab in addition to 269 maunds of seed procured in the Tanjore district. A total quantity of 3,070 maunds of seed of this variety was distributed during the year.

The targetted quantities of seed of improved varieties could not be procured due to adverse seasonal conditions and failure of crops in 1952–53, particularly in the southern districts. With reference to Co. 2 the procurement was limited to a small quantity as this is being replaced by a superior variety M.C.U. 1 in most of the areas where Cambodia is grown.

The total expenditure incurred on the procurement of improved seeds was Rs. 3·04 lakhs. This was met from a loan granted by the Government of India.

Fertilizers and pesticides.—The quantity of ammonium sulphate distributed for cotton through departmental and co-operative agencies was 1,680 tons. The quantity of pesticides distributed by the department was 2,317 lb.

Publications.—Fifteen popular articles for propaganda for popularizing the different ways of the extension of cotton and increasing its productions were published.

Achievements of area and production under the plan of cotton extension.—The targets under the different items of the Cotton Extension Plan were 42,296 acres and production 43,318 bales of 392 lb. The area and production achieved were 20,582 acres and 17,856 bales respectively. The details are furnished in appendix.

Under " reclamation of waste and fallow lands " an area of 5,354 acres were achieved as against 5,400 acres targetted and under " Replacement of crops " an area of 10,863 acres was achieved against 9,000 acres targetted. Of this about 6,000 acres are in the lower Bhavani Project area in the Coimbatore district, where water was supplied for irrigation for the first time this year. Under " Double cropping ", i.e., cultivation of cotton in rice follows the area achieved was only 4,524 acres against a target of 13,700 acres. This was due to the favourable rainfall condition for growing paddy. In the Cauvery delta planting of second crop paddy was continued up to December 1953 and the harvest up to the end of March 1954 and was also delayed due to the strained relations between mirasdars and cultivators. Sufficient labour was not available even for harvesting the crop in time. So the cultivators were reluctant to grow cotton. Facilities for irrigating the crop during summer when river channels will be closed were also insufficient.

The area under " Inter-copping " was only 28,569 acres as against a targetted area of 233,300 acres. This is mostly in unirrigated groundnut and irrigated groundnut and ragi. The attainment was low as early south monsoon rains were deficient, in the regions where groundnut is a major dry land crop and it was not sown to the extent anticipated. With reference to the Application of fertilizers ' the area attained was 11,168 acres against a target of 36,000 acres ; this does not indicate the total area to which fertilizers were applied as the distribution of ammonium sulphate was decontrolled and the fertilizer was sold by manure dealers also, for which details were not available. The area covered by " improved seeds " of cotton this year was 117,183 acres against a target of 192,010 acres. Sufficient seeds of improved seeds could not be procured from the 1952–53 crop due to the adverse season. This was particularly so with regard to Karunganni 2. Only 453 maunds of seed of this variety could be procured against a targetted quantity of 140,000 maunds. The total area so far covered by improved strain in the residuary Madras State, including natural spread was 5·3 lakhs of acres or 62·9 per cent of the total area of 8·5 lakhs under cotton.

Against " Improved cultivation methods " an area of 6,416 acres was covered as against 2,000 acres targetted. Though it was not possible to attain the additional acreage and production during 1953–54 in full yet the total acreage and production of cotton stood above that of the previous year (1952–53). According to the final forecast report released recently the area and production of cotton in Madras State are estimated to be 848,500 acres and 262,400 bales which are 16·6 per cent and 23·1 per cent respectively more than those of the previous year.

X. RESEARCH.

The research work pertaining to the department is carried on at the Agricultural Research Institute and the breeding stations attached to it at Coimbatore as well as in the Agrultural Research Stations and regional research centres throughout the State. The review of research work reported is presented below under the following heads :—

(1) Research Council.
(2) Agricultural Chemistry.

(3) Agricultural Entomology.
(4) Agricultural Mycology.
(5) Agricultural Meteorology.
(6) Crop improvement.
(7) Systematic Botany.
(8) Plant Physiology.
(9) Cyto-genetics.
(10) Botanic gardens and Park.
(11) Agronomy.
(12) Agricultural Engineering.
(13) Agro-industries.
(14) Agricultural Reserach Station.

1. Research Council.

Twenty-four meetings of the Council were held for the scrutiny of research programmes, progress reports and miscellaneous items of research during the period under report.

2. Agricultural Chemistry.

Analytical and advisory.—This branch of the section has, as usual been catering to the requirement of the ryots, Government departments, industrial concerns and general public by analysing soils, manures, irrigation water foodstuffs and fodders, plant materials and other miscellaneous samples and giving appropriate advice to the parties. Besides the analytical and advisor work referred to above the section continued to do the useful work of answering queries received on matters pertaining to the improvement and maintenance of soil fertility, manuring of crops, feeding of livestock, irrigation waters, reclamation of saline and alkaline lands and several other allied subjects.

On 1st October 1953 there were 1,808 samples pending analysis. Most of these were departmental samples of soils and plant materials. During the period under report 1,497 samples were received and registered. Of the left over 1,808 samples, 1,172 were rejected. One thousand eight hundred and ninety-six samples were analyzed and reported upon. Thus at the end of the year there were only 235 samples pending analysis.

The samples received during the year may be classified as indicated below according to their nature and source of receipt :—

	Receipts.				Disposals.			
	Agricultural Department.	Other Government Department.	Private and manure firms.	Total.	Agricultural Department.	Other Government Department.	Private and manure firms.	Total.
Soils	463	8	29	500	666	10	33	709
Plant materials (permanent manurials).	59	..	..	59	212	..	..	212
Manures	71	7	137	215	87	15	128	230
Foods and feeding stuffs.	591	18	6	615	621	21	6	648
Waters	14	3	9	26	14	3	8	25
Miscellaneous ..	15	66	1	82	9	66	1	76
	1,213	102	182	1,497	1,609	115	176	1,900

The receipts by way of analysis fees amounted to Rs. 2,755 for the period under report. Among the most important items of work carried out in the sub-sections may be mentioned the following :—

(1) *Soils.*—The samples of soil sent by the Executive Engineer, Public Works Department, Cuddalore, to find out the suitability for opening a demonstration farm in Kazhiveli swamp, Markanam, were analysed. The soils were found to be sandy with an excess amount of water soluble salts from the second foot downwards. The sire was declared to be unsuitable for opening the demonstration farm.

(2) *Cotton in paddy fallows.*—Depletion of nitrogen in case of cotton and paddy was noticed. The differences between the two was not marked.

(3) *Kole cultivation in Malabar.*—The soils and drainage waters were found highly acidic and soils deficient in lime. Improvement of drainage and application of lime would help in reclamation of these areas.

Soils—Research—Rapid tests and plant tissue tests.—To have reliable and quick tests to analyse samples of soils and plant tissues for diagnostic and advisory works, research was carried on for about four years. A reliable and quick method for estimation of phosphoric acid has been standardized. These tests are for the use of the trained staff who can conduct rapid tests and supply information to the cultivators quickly.

Trace elements.—This was started during the year for the estimation of trace elements on soils. Methods have been standardized for estimation of Manganese and chromium. Research work is to be continued.

Laterite soils.—Studies to find out the best means of combating phosphate reversion in laterite soils were in progress for three years. Field trials and pot experiments and analysis of samples of grain and straw were carried out. The results indicate that for good crop production in laterite soils, application of phosphatic manures must be supplemented with green manures at 7,500 lb. and lime at 3,000 lb. The results will be passed on to the Extension staff for propaganda and demonstration.

Agronomic experiments at Satyamangalam.—To study the changes brought about in the dry soils of the Lower Bhavani Project area consequent on irrigation and to evolve methods to improve their fertility, research has been proceeding for the past two years. The results indicate that the fertility of the poor sandy soils can be improved by growing legumes and ploughing them in. Work is still in progress.

Krilium on clay soils.—To improve the physical condition of the heavy soils, 'Krilium' a soil conditioner which was found efficient in foreign countries was tried. The results indicate that the crumb structure and tilth of heavy soils could be improved by the use of Krilium. But the cost of Krilium is high and beyond the means of ordinary cultivators.

Manures and plant nutrition—Permanent manurial experiment.—To obtain information on the effect of major plant nutrients added singly or in combination, year after year on the properties of soils and on yield under rainfed and irrigated conditions, these experiments were going on for a long period (old series 45 years, new series 29 years). Phosphorus has been found to contribute the maximum to raise yields of crops followed by nitrogen, complete artificials were as good as cattle manure. This is an item of fundamental research and has to be continued.

Silico phosphate.—Research was directed to convert the unavailable phosphate in rock phosphate into Silico phosphate of good availability for use in laterite soils to prevent the mobilization of the added manure. Silico phosphate is best suited for laterite soils as it does not undergo reversion as rapidly as superphosphate. Experiments have shown that by fushion at 1550°C Silico phosphate containing 70 per cent of the total phosphate in the available form, can be prepared.

Biological properties of differently manured plots.—Research to obtain information on the biological properties of soils receiving plant nutrients singly and in combination, was in progress for three years. The effects of manure, seasons and irrigation were more pronounced on microbial population and their activity, than that of crops. Organic manures increase the microbial population and their activity, and hence ryots are advised the use of a combination of organic and inorganic manures.

Composts.—To find out the best method of preparing compost for cane trash, research was in progress for two years. Pig dung used as starter was found to produce good compost.

The following schemes of the Indian Council of Agricultural Research and Technical Co-operation Mission are working under the technical and administrative control of the Government Agricultural Chemist, Coimbatore :—

(1) Simple manurial experiments in ryots fields and soil survey of Tanjore district (Stewart's Scheme)—Indian Council of Agricultural Research.

(2) Scheme for determination of soil fertility and fertilizer use under Technical Co-operation Mission Project (Government of India).

(3) Storage trials with chemical fertilizers—Technical Co-operation Mission Project.

(4) Agronomic experiments—Technical Co-operation Mission Project.

The results for these trials would be reviewed as an All-India basis as they were being conducted on a co-ordinated basis all over India.

3. Agricultural Entomology.

Investigations on crop pests.—Special attention was paid towards evolving suitable method of control against tissue borers. Intensive work on synthetic chemicals with reference to their adaptability in pest control, their adverse and beneficial effects, studies on fumigants and stored products pests formed other more important lines of investigations. Fundamental work on the incidence of sugarcane borers, and research on bee-keeping were also in progress under special schemes. A summary of the work done is furnished below :—

(*a*) *Pests of paddy*—(i) *The paddy stemborer.—Schoenobius insérteellus, Wlk.*—Work on the control of this pest was in progress at the Agricultural Research Station, Aduthurai, Central Farm, Coimbatore and the Paddy Breeding Station, Coimbatore. At Aduthurai, the comparative merits of sprays of Folidol 0.025 per cent, BHC. 0.1 per cent and BHC. 10 per cent dust were studied. The data gathered have shown that two to three rounds of periodical applications of sprays of Folidol and BHC, lower the incidence of the stem-borer appreciably, at the same time augmenting the yield. Work was in progress since 1949. The findings which will considerably help to reduce stem-borer damage will be transmitted to the Plant Protection staff for adoption in the districts.

(ii) *The paddy mealy bug* (Ripersia Oryzæ, Gr.).—Direct applications of sprays of Folidol 0·05 per cent and BHC 0.2 per cent caused a high mortality and arrested the expansion of the 'Soorai' patches. Sprays of 'Systox' and 'BEPO' also gave indications of controlling this pest.

(iii) *Field rats* (Bandicota Bengalensis, G & K., Millardia Meltada G).—Research work on the control of these rodents was concluded at the Agricultural Research Station, Aduthurai. The major trouble was due to the male rats—*Bandicota sp.* which exhibited bait shyness to a considerable degree. They were not attracted to zinc phosphide baits in large numbers. The grass rat—*Millardia Meltada G.* was comparatively harmless and took to the poison baits more readily. Systematic digging and catching by professionals, setting up of bow traps throughout the season, followed by poison baiting with zinc phospide baits prepared with the addition of a few attractants like onions fried in oil, were found to give the maximum relief against damage by field rats, in general. Dethmor warfarin, kept in permanent bait stations, proved effective against migrating rats. The results will be passed on to the Plant Protection Staff for adoption.

(iv) *The paddy Jassid* (Nephotettix Bipunctatus, L.) *and the Paddy Fulgorid* (Nilaparvata Lugens, S.).—These pests are, of late, gaining some importance in the Tanjore area. They are more severe during the Thaladi seasons. Evolution of suitable prophylactic treatments with a mixture of DDT and BHC are being attempted at the Agricultural Research Station, Aduthurai. Studies on the life history and bionomics of these pests are being continued.

(*b*) *Pests of vegetables*—(i) *The little leaf disease of brinjal and the vein clearing disease of Bhendai.*—Studies on the control of the insect vectors—*Empoasca Devastens, D., Eutettix Phycittis, D* and *Bemisia Tabaci L.*—By insecticidal means and correlating the data with the incidence of the diseases, did not yield useful results. The treated and control plots remained free of the little leaf disease. None of the chemical were able to ward off the vein clearings disease of bhendai. Raising of bhendai crop in an area free of diseased plants and other infested malvaceous weeds and systematically removing diseased once as and when appear, proved to be the best method of control. Work was commenced in 1952 and is to be continued.

(ii) *The seed potato weevil* (Cylas formicarius Fb.)—Insecticidal trials against this weevil, having dusts of Lindane 0.65 per cent DDT 5 per cent and Lindane spray 0·1 per cent, DDT spray 0.1 per cent and calcium arsenate plus lime used in a dust form, as the different varients, did not give conclusive results. Work was started in 1950 and has to be continued.

(iii) Exploratory trials against the potato tuber moth, *Phthorimoca operculella Z.*, were taken up at the Agricultural Research Station, Nanjanad.

(*c*) *Pests and fruits.*—Investigations on the bionomics and life-history of the fruit fly, *Chaetodacus sp.* , on plums were taken up. Varieties like 'Gaviota' escape the infestation by virtue of their coming to harvest early in the season. Work was commenced in 1950 and has to be continued for confirmatory results.

(*d*) *Pests of cotton.*—At the Agricultural Research Station, Aduthurai, the efficacy of sprays of Folidol 0.025 per cent Ekatox—20, 0.25 per cent and B.H.C. 0·1 per cent applied at fortnightly intervals, was studied with reference to the control of the spotted bollworms of cotton.

Earias spp.—Folidol and Ekatox gave uniformly convincing results both as regards a reduction in pest incidence as well as an increase in the yield. Work was commenced in 1950 and the results will be passed on to the Plant Protection staff for adoption.

(*e*) *Pests of stored produce*—(i) *The effects of mixing synthetic chemicals and other insecticides with seed materials.*—A variety of seed materials were mixed separately with lindane 0·65 per cent dust, Geigy 33 (DDT 10 per cent) acorus and sulphur dust at different dosages varying from 1 : 100 to 1 : 500 parts of seeds by weights, to evolve suitable methods of preserving seed material from insect damage during storage. Lindane was effective only at higher dosages for a period of one year. DDT 10 per cent (Geigy 33) proved effective against stored product pests at all the concentrations tried. Acorus and sulphur dust were less effective. At the rate of 1 : 100 parts of seeds, these were of some use for a period of about three months. Results will be transmitted to the Plant Protection staff for adoption.

(ii) *Fumigation of oil seeds with methyl bromide and Killoptera.*—Studies on the fumigation of oil seeds with the abovementioned chemicals were continued with reference to niger, safflower, linseed, mustard, and tobacco. Analysis of samples down at periodical intervals, soon after fumigation, did not reveal any bromine residues. Viability tests were conducted and there was no difference in the percentage of germination of the treated and control lots. Exhaustive enquiries which were conducted have resulted in fixing the tolerance limit of bromine residues at 50 parts per million. The residues of Ethylene-di-chloride and carbon-tetrachloride mixture (Killoptera) are non toxic. The general conclusions are that at a dosage of two pounds per 1,000 cubic feet with an exposure of 24 hours, Methyl Bromide can be safely used in the treatment of infested oil seeds. An authoritative opinion on this subject is awaited from the Director-General of Health Services, New Delhi. Work was in progress since 1952.

(iii) Studies on the bionomics and control of bruchids were continued. Keeping a layer of sand or acorus dust up to a height of about an inch above the seed materials was found to be an easy method of overcoming the incidence of the pulse *bruchid-Bruchus sp.* Work was in progress since 1952 and results will be transmitted to Plant Protection staff for adoption.

(*f*) *Work on insecticides and fumigants—Testing of proprietory insecticides and new chemicals.*—This aspects continued to be one of the major items of research of this section. In all ten samples of proprietory preparations (different brands of Chlordance, Toxaphene, BHC, Lindane and Parathion) were tested critically and their insecticidal efficacy assessed. All of them were found effective and compared favourably with similar products now in use in plant protection. The newer formulations of pesticides, viz., Aldrin, Dieldrin, Endrin (Hymen compound 269) were tested against a variety of insects, under field conditions and their superiority or otherwise over the formulations now in vogue assessed. These findings would go a long way in improving the standard of plant protection work in the districts. Work was in progress since 1950 and the results will be transmitted to the Plant Protection staff for adoption.

Studies on the adverse as well as beneficial effects of synthetic chemicals were pursued. Folidol spray at 0·25 per cent, Aldrin and Dieldrin spray at 0·1 per cent did not cause any phytocidal action in cucurbits. Two rounds of application of DDT as a dust at 5 per cent or spray at 0·1 per cent was found to augment the yield of groundnut. Treating the chilly crop twice at the flowering stage with BHC 10 per cent dust or spray at 0.1 per cent did not cause any phytocidal injury or interfere with the palatability of the produce. A beginning was made in the study of soil insecticides. Almost all the synthetic chemicals now in use in plant protection did not affect the viability of seeds when used as a soil insecticide at the rate of 5 to 25 lb. per acre.

(*g*) *Biological control.*—The Australian predator beetle—*Cryptolaemus montrouzieri* Muls gave some indications in the control of *Leeanium sp., Pseudo coccus virgatus Ckl, Pulvinaria maxima Gr. Pscudococcus cormbatus Gr.,*

Dactylopius tomentosus, L and *Phenaccoccus insolitus Gr.* Further work on this predatory beetle is in progress.

(*h*) *Bee-keeping.*—Research on the improvement of the honey gathering capacity of *Apis indica F.*, was in progress since 1952 under a special scheme financed by the Indian Council of Agricultural Research. The performance of pedigree queens was under study at Coimbatore and in South Kanara district (Sulliya and Badiadika) a more favourable locality for bee-keeping. They have generally given higher honey yields than the controls. Two more colonies from the bulk have been selected, for queen rearing. Agva americanna was found to be a good source of nectar. The quantity of pollen and nectar collected by single bee per trip, were estimated from a total of 14 sources. Studies on the bee enemy—*Acanthaspis siva D*, pollen substitutes and biometry of bees were continued. 'Dequeenings' and 'Artificial division' have given more encouraging results in the experiments on swarm prevention. Work has to be continued for evolution of pedigree colonies which give high honey yields.

Sugarcane Borer Pest Scheme (*financed by the Indian Central Sugarcane Committee*).—As per the technical programme, research work was continued during 1953–54 in the Sugarcane insect Pest Scheme. The influence of weather factors on the borers (*Chilotraea infuseatellus Proceros indicus k.* and *Scirpophaga nivella F*) mortality and compensation indices studies, examination of alternative host plants, etc., were under detailed observation. All the data collected on the loss in yield due to the borer infestation in 1953–54 have been sent to the Entomologist, Indian Institute of Sugarcane Research, Lucknow, for analysis. The crop for 1954–55 season was planted in April 1954 and the observations on the production of tillers, incidence of pests, etc., are in progress.

Fundamental work.—Studies on the bionomics of important Coccinellids predaceous on aphids and scales were continued. The alternative hosts of *Brumus sutularis* F were determined. *Chilocoris nigritus* F was of some use, in the control of hard scales like *Lecanium sp.*

Incidence of Locusts.—The incidence of desert locust, *Locusta migratoria* L, was reported from Ramanathapuram district during the period under report. On an inspection of the affected area, it was learnt that swarming had begun by about the second week of February 1954 from the southern borders of Aruppukottai and Mudukulathur taluks. These gradually moved towards the north and north-west and completely migrated from the area by third week of March. On the whole about 21 villages in a radius of 12 to 15 miles from Arupukottai appear to have been affected. None of the standing crops were damaged, as the hoppers preferred to feed on monocots confining their attention to grasses and cholam leaves emerging from the ratoons. It was evident that breeding has been taking place in the area itself as the occurrence of winged and wingless hoppers was common during February-March. A possible recurrence of the pest was anticipated during May-June. But no further swarms were reported.

Plant Quarantine work.—The Plant Quarantine staff, stationed at Mettupalayam and Shembaganur, continued to intercept traffic and examined notified plants for the presence of cottony cushion scale—*Icerya purchasi*. Mask—These were allowed to be moved to the plains only after fumigation with calcium cyanide. A total quantity of 116½ tons of wattle bark was fumigated, besides other consignments of notified plants.

Miscellaneous—Fumigation and Phytosanitary work.—A total quantity of 235 bags of seed material was fumigated and rendered pest free for the various specialists. In all 42 Phytosanitary certificates were issued for the despatch of plant and plant material to countries outside India by different agencies.

4. Agricultural Mycology.

Research into the causes of the disease for devising different methods of control, selection of varieities resistant to the diseases and trial of fungicides, were in progress in the Mycology Section for the following diseases :—

Rice diseases.—(*a*) *Blast* (Piricularia oryzae).—One culture 6,538 found resistant to blast at Coimbatore is under multiplication. Kirubilia a medium duration variety was found to be highly resistant. Application of high doses of nitrogenous manures was found to favour the incidence of the disease and potash and phosphates do not seem to offset the adverse effect of excess nitrogenous manures. The need for judicious nitrogenous manuring in Tanjore and Coimbatore districts, where the blast diseases is prevalent, is stressed and brought to the notice of cultivators through the Extension staff. Research in this direction is a continuous work.

(*b*) *Stem Rot* (Sclerotium oryzae).—Rice varieties, Adt. 3, Adt. 9 and Adt. 20 were found to be highly susceptible. The incidence of Jassids and Fulgorids favoured the onset of stem rot disease. Work was in progress since 1949 and has to be continued.

Ragi Blast (Piricularia sp.).—Research work was in progress since 1949. Ragi variety K.R. 4 from Koilpatti which was reported to be resistant to blast is under trial and work has to proceed till resistant strains are released.

Cereal rust—(*a*) *Wheat rust* (Puccinia graminis, p. triticinia *and*, p. slumarum).—Fifteen varieties of wheat were under test for determining resistance. Work was in progress since 1947. The variety *Gabo* is already under distribution in the Nilgiris. Another variety, Kenphad 28 is found promising.

(*b*) *Sorghum rust*—(Puccinia purpurea).—Fifteen cultures were found to be resistant even under artificial inoculation.

Cumbu rust (Puccinia Penniseti).—One culture 814/3 exhibited very high resistance to rust and this will be multiplied for distribution.

Tenai rust (Uromyces Setariac italicae).—Of the 15 Japanese varieties tested, 6 were found to be highly resistant. These will be used by the cytogeneticist for breeding work.

Black arm disease of cotton (Xanthomonas malracearum).—Two selections of 2,196 continued to exhibit resistance to black arm disease. Four more cultures were found resistant. Seed treatment with organo-mercury compounds was found to be effective in controlling seed corne infection. Spraying with copper and Mercury fumicides reduced secondary infection and gave increased yields. The results were passed on to the Plant Protection staff for adoption. Research work was in progress since 1939 and has to be in progress.

Vegetable diseases—Root-rot and Wilt.—Drenching the soil with 0·1 per cent wettable ceresan gave complete control of root-rot of chillies caused by *sclerotium rolfsii*. Work was in progress since 1949 and the result was passed on to the Plant Protection staff.

Diseases of pulses.—Investigation into the root-rot disease of pulses, was taken for the first time during the year and studies of the fungi concerned are in progress.

Banana wilt disease.—This is a new item of research taken up during the year. Banana varieties poovan, Raja Vazhai, Vamanakeli, Peyladem were not infested, while 13 other varieties were found susceptible. The fungus was found to die out when two inches of water was kept standing over the soil. Work is still in progress.

Orange diaseases.—Research with the etiology of the disease and evolution of control measures were in progress since 1952. Application of manures to the soil and foliage sprays of urea improved the condition of the declining trees. These findings were made known to planters in Wynaad are and demonstrations were also given regarding control measures against the disease.

Potato virus disease.—Production of disease-free seed, which will help to increase yields of the Potato crop was taken up during the year. Three and half acres of disease free potatoes of "*Great-scot*" variety were raised. These will be further multiplied under strict inspection and distributed to cultivators.

Areca stem breaking disease.—To find out the causes for this disease, research was taken up under a scheme financed partly by the Indian Central Arecanut Committee in 1952. Investigations so far made, show that the formation of fissures and cavities on the stem, is due to the combined action of exposure of the stem to sun and later infection by several fungal wound parasites. Work is proceeding.

Ergot of rye.—The production of ergot on which research was commenced in 1944 was continued now on the Ergot Farm only. Five hundred and eighty two pounds of ergot and 6,577 lb. of rye were produced.

Plant Quarantine work.—Seeds and Plant materials intended for export were examined and phytosanitary certificate were issued.

5. Agricultural Meteorology.

The object of the Agricultural Meteorology Section, Coimbatore, is to collect data on the influence of climatic factors on crop growth and yield and also incidence of pests and diseases on crops. Long range collection of data is essential before the incidence of pests and diseases on crops from a knowledge of the existing weather conditions, is attempted to be forecasted with a fair degree of success.

Main lines of research pursued in this section.—(i) Collection of daily meterological and microclimatic data the latter both in the open and cropped fileds at 7 a.m. and 2 p.m. hours, is being attended to regularly.

(ii) After the division of the Madras State four Agricultural Research Stations are continuing the crop-weather experiments for the sixth year in succession. The crops that are under this experiment are as detailed below :—

(*a*) Coimbatore—Paddy, cotton and cholam.
(*b*) Aduthurai—Paddy long duration and short duration.
(*c*) Pattambi—Paddy first crop and second crop.
(*d*) Koilpatti—Cotton and cumbu.

Observations are recorded in the abovementioned crops as per the technical programme drawn up by the Director, Agricultural Meteorology, *Poona* on *All-India* basis.

A record of the outbreak of pests and diseases is being maintained in addition to the collection of data on weather conditions in order to assess the influence of the weather conditions on the extent of damage done by pests and diseases to crops.

Studies in collaboration with the Government Entomologist and Government Mycologist in the prediction of outbreak of pests and diseases on crops.—(*a*) Systematic data are being collected in groundnut, ragi and cholam crops to assess the relationship existing between the meteoroligical elements and the incidence of pests and diseases on crops.

(*b*) Ten Agricultural Research Stations are collecting details by eye observations, on the influence of meteorological conditions on the incidence of pests and diseases on crops.

Research.—To collect precise data on the influence of the various meteorological factors on the growth of cholam crops, systematic data were collected on height, number of tillers, number of fully opened leaves and number of internodes on 24 plants selected at random in each of the two varieties of cholam, namely Co. 1 and Co. 3. The observations were recorded from the bulk area of the crop weather plots.

6. Crop Improvement Work.

(*a*) *Paddy.*

1. *Pure line selection for evolution of high yielding strains.*—A number of selections from 47 local varieties in the State for which there are no Departmental strains were under study.

Eight hundred and twenty-seven selections from several varieties were carried forward for further study. Twenty cultures capable of replacing 28 local varieties have been taken up for trials in the Districts.

Three cultures for the first crop and one culture for the second crop of South Kanara await to be released as strains. They yield 10 to 20 per cent more than ryots' varieties and will serve an area of 160,000 acres.

2. *Varietal trials.*—The object of the trial is to find out if the strains and varieties already evolved for certain regions would suit other regions and tracts. The trials were inconclusive at Aduthurai, Pattambi and Pattukkottai.

At Mangalore it has been established that MTU. 3, MTU. 4 and MTU. 20 for the first crop, PTB. 4, PTB. 20 and Co. 3 for the second crop and PTB. 9 and MTU. 15 for the third crop were quite suitable.

3. *Hybridization.*—This research work is done with the object of combining certain desirable characters as blast resistance, drought resistance, flood resistance stiff straw, dormancy, earliness, etc., along with high yield of existing strains released for cultivation.

A number of cross progenies were studied for evolution of strains for various purposes.

Apart from the progenies that were under study for blast resistance under the Indian Council of Agricultural Research in Blast Scheme, a total number of 5,551 progenies of crosses made for other purposes such as drought resistance, saline resistance, evolution of types with seed dormancy and the other qualities of seed, adaptibility to periods and seasons and other specific agronomic characters were carried forward for further study. Six high yielding cultures are to be sent up for trials in the districts. Strains evolved from the several groups will be useful to replace the local varieties and existing strains over an area of five and half lakhs of acres of the State.

Work was in progress from 1930 but has intensified since 1943 onwards and has to be continued.

4. *Agronomic work*—(*a*) *Manurial trials.*—Trials on the method of application of phosphatic and nitrogenous manures were studied at Coimbatore, Tirukuppam, Mangalore and Palur since 1950. The trials to compare the Japanese method of rice cultivation with the local farm method of cultivation were under way at all the rice stations of the State during the year.

The results of the year showed that phosphates applied in the presence of green leaf, became more easily available to plants and the yields showed increase. There was not any significant difference between different kinds of phosphate, viz., dicalcium phosphate and super phosphate. With regard to nitrogenous manures it has been found that chilean nitrate was no better substitute to ammonium sulphate. The placement of ammonium sulphate at 30 lb. per acre was satisfactory when the spacing adopted was 10 inches by 10 inches and 30 lb. N per acre broadcast on surface was better than 'placement' for a spacing of 6 inches by 6 inches. The other manurial experiments did not show definite trends. The results require to be confirmed before passing on to the cultivator. The information on the best and judicious method of manuring will benefit the Agriculturist engaged in paddy cultivation over an area of four lakhs of acres.

(*b*) *Cultural trials.*—The Udu trial was conducted at Agricultural Research Station, Aduthurai, during the year under review also.

The results of the year showed that 3 of Kuruvai and 1 of Ottadan are the best Udu combinations. Manuring Ottadan crop with Ammonium sulphate after harvest of Kuruvai gave increased yield.

The final recommendations on these lines will be useful to the ryots of Tanjore district to increase their yields from both the components of the mixture.

Fundamental work.—Induction of mutations and production of economic Poly-ploids in collaboration with the Cytogeneticist, is carried on since 1939. One mutant from Co. 13 awaits district trial. Research work was to be pursued.

Seed distribution.—The quantity of seeds of improved strains distributed during the year is given below.

Name of station.	Quantity of paddy seed distributed. LB.
1 Paddy Breeding Station, Coimbatore	40,944
2 Paddy Breeding Station, Mangalore	31,678
3 Rice Research Station, Tirurkuppam ..	15,194
4 Rice Research Station, Ambasamudram ..	55,398
5 Agricultural Research Station, Pattambi ..	90,132
6 Agricultural Research Station, Aduthurai ..	90,132
7 Agricultural Research Station, Pattukkottai ..	51,635
8 Agricultural Research Station, Palur	30,217
9 Agricultural Research Station, Paramakudi ..	4,355
Total ..	4,09,685 or (about 183 tons)

The area estimated to be covered by the above quantity of paddy seed is about 10,240 acres. The estimated additional production of paddy is about 686 tons and the economic gain to the State is computed at about Rs. 1,92,000.

(*b*) *Millets and pulses.*

Selection work and hybridization for the evolution of improved strains of millets and pulses were continued at Coimbatore and at the regional centres of work. Of the eight millets, cholam, cumbu, ragi and tenai received more attention and the work on these was carried on at most of the centres. The minor millets, varagu, samai, panivaragu and kudiraivali were dealt with at Coimbatore and at two other regional centres. Pulses work was carried on at Coimbatore and Tiruppattur. A brief account of the work done and the result achieved is given under each crop. Four strains of Millets were released during the year. Their particulars are furnished in Appendix 5.

Millets.

(*A*) *Cholam.*—Season was favourable particularly for the early sown groups of cholam. In Periamanjal the premier dry land variety of Coimbatore 23 selections of the second generation from crosses between bold grained reddish straw type and juicy types were taken for further studies. In addition to these, 14 fresh crosses were also effected to combine high grain yield with juiciness and reddish purple straw colour which are considered as valuable attributes in this variety. On selection of Talaivirichan with juicy stalks and five selections with bold grains, have been brought to final yield trials. One selection T.S. 29, isolated from collections at the Regional Millet Station, Tiruppattur was sent for trials in North Arcot and Salem districts. Five promising selections have been advanced to yield trials. Vellaimakkattai selections A.S. 7537 and A.Ch. 183 were significantly superior to the local variety in yield trials at the Regional Millet Station, Ariyalur. In Irungu, from the progenies of crosses between A.S. 7081 Periamanjal by Irungu and high yielding Irungu types, as well as high yielding juicy types of Periamanjal cholam, 21 selections with pithy stalks and 20 with juicy stalks have been brought to preliminary yield trials at the Millet Breeding Station, Coimbatore. In an experiment to determine the optimum seed rate for the Periamanjal by Irungu selection A.S. 7081 at Koilpatti. It is found that the optimum seed rates per acre were 40 lb. for grain and 60 lb. for fodder. In yield trials conducted at Coimbatore in a Striga sick field, seven selections from the progenies of crosses between strain Co. 1 and A.S. 4003 (Bonganhilo) a type reputed for striga resistance, were superior to the standard Co. 1 in grain yield and striga resistance. The best two of these will be issued for trials in places where the striga attack is severe in Coimbatore district.

Irrigated cholam varieties.—The work done and progress achieved in the three main varieties of irrigated cholam have already been summarised in Part I of the Administration Report. In District trials, strains Co. 9 and Co. 12 recorded 57 and 74 per cent more yield than the local in Tiruchirappalli, while Co. 9, Co. 14, Co. 15, Co. 17 and Co. 18 gave increased yields ranging from 19 to 95 per cent in Coimbatore and Ramanathapuram districts.

(*B*) *Cumbu.*—The work was in progress on the evolution of high yielding hybrids under a Scheme partly financed by the Indian Council of Agricultural Research since 1949. Three hundred and two in-bred lines were studied and 609 selections were brought to different generations of in-breeding. Twelve hybrids of short duration and 13 of medium duration were tested for yield under irrigated and rainfed conditions respectively. Ten of the 12 hybrids of short duration and three of the 13 hybrids of medium duration were significantly superior to their standards (control) Co. 3 and Co. 1 respectively. One hybrid of short duration, H. 866, tried in a replicated trial in comparison

with a local variety of short duration, in the field of a farmer at Coimbatore recorded 29 per cent more grain than the local. This and two other hybrids of short duration were tried in other centres of Coimbatore taluk and they were found superior to the local variety. At the Agricultural Research Station, Koilpatti, all of the eight hybrids tested in preliminary yield trials, were superior to the parents and standard K. 1, under irrigated conditions, while only one was superior to the standard under rainfed conditions. At Tirupattur, two promising cultures were advanced to final yield trials while one high yielding selection of short duration suited to the early season was advanced to district trials at Ariyalur.

(*C*) *Ragi.*—Three high yielding selections E.C. 4,573, E.C. 4,310 and E.C. 3,601, which completed trials both at the Millet Breeding Station, Coimbatore, and in the districts were released as strains Co. 5, Co. 6 and Co. 7 respectively. It is estimated that these three strains are capable of spreading over an area of 30,000 acres and giving about 5,030 tons of additional production of grain valued at Rupees 15 lakhs. In the studies on grain shape in this millet, the common round shape was found to be recessive to the rare kidney shape, met with in a mutant. To combine high yield with resistance to blast (Piricularia) hybridization was resorted to and the progenies were under study. At Palur from the 200 single plants studied in observation plots, 78 selections have been advanced to preliminary yield trials for comparison with strain P. 1 Four selections from progenies of crosses between strains. K. 1 and K.R. 4., to combine the high yield of the former and the non-lodging habit of the latter, were tested in preliminary yield trials in comparison with K. 1 at the Agricultural Research Station, Koilpatti. The yield differences were not significant though all the four selections gave higher yield than the standard.

(*D*) *Tenai.*—One short duration selection S.I. 4,894 from a cross was advanced to district trials, and seven promising selections superior to strain Co. 1 were advanced to yield trials. Eight samples obtained from Japan were found to be tolerant to rust and further studies are in progress.

(*E*) *Minor millets.*—Strain Co. 1 of Varagu, was found suited to the southern and central districts where it recorded increased yields over local varieties. At the Regional Millet Station, Ariyalur, this strain and selection P.S. 76 along with three new selections isolated at the station, gave 21 to 43 per cent increased yield over the local. One selection of Panivaragu P.V. 14, isolated at Coimbatore, was given strain number as Co. 1 after completing trials in the districts. This is capable of spreading over 1,000 acres, and giving about 70 tons of additional production of grain valued at Rs. 18,000. Six high yielding selections of Kudiraivali were advanced to yield trials at Coimbatore. At Koilpatti, selection P.S. 75 of varagu and selection P.C. 838 of Kudiraivali recorded the highest grain yields of 1,826 lb. and 471 lb. per acre respectively in observation trials.

Pulses.

Twenty-four selections in each of redgram and blackgram and five of greengram were brought to yield trials. In lablab, out of 48 selections tested for yield, eight were superior to the standard. Fifteen selections of Cowpea recorded higher yields than their standards C. 57 and C. 521. Twenty-five selections of Clusterbeans and 17 of Soyabean were grown and selections made for further work. Selection No. 35 of horsegram gave promising results in trials conducted in the fields of cultivators in Southern districts.

Distribution of seeds of improved strains of millets and pulses distributed during the period 1st October 1953 to 30th June 1954—

Crops.	Quantity distributed in pounds.	Area expected to be covered. ACRES.	Additional production estimated. TONS.	Economic and gain to the State. RS.
Cholam	16,805	1,521	85·2	28,116
Cumbu	38,280	4,779	267	86,100
Ragi	14,280	2,380	265·6	79,680
Tenai	1,074	215	3·8	912
Minor Millets	1,090	156	2·8	672
Pulses	3,177	289	3·9	1,365
Total ..	74,706	9,340	628·3	1,90,845

These seeds are expected to cover an area of about 9,340 acres in the first instance and in later years will cover larger areas through natural spread.

The total area so far covered by improved strains of millets.

(c) *Oilseeds.*

Groundnut.—Research work on groundnut was continued with the main object of evolving strains with high yield, oil content and shelling percentage and possessing resistance to pests and diseases. The optimum cultural and manurial requirement of the crop and advantage of growing groundnut as a mixture and in rotation with other crops were also under investigation.

Trials of varieties and selections for evolving high yielding strains with high oil content.—Three bunch strains from Bombay, Madhya Pradesh and Mysore were compared with the local T.M.V. 2 strain for the third year. The strain H.G. 5 from Mysore recorded very poor yields while the other two were on a par with T.M.V. 2 strain. Two spreading strains from the Punjab and Uttar Pradesh were inferior to the local strains but the one from Punjab was on a par with the local Mauritius. The quality of the extra State strains was also poor. Three selections from Local Mauritius were inferior to the strains.

Fourteen selections from big seeded varieties were compared with the local and the standard strains. Only one selection was superior to T.M.V. 3 and two were superior to T.M.V. 1 Strain A.H. 6481 was found to do well in Coimbatore district with 11 per cent increase over local and seeds were supplied for multiplication in Pollachi area.

Hybridization.—Twenty-four new crosses were effected between selected bunch and spreading pure lines with the following objects :—

(i) To evolve a high yielding dormant bunch strain ;
(ii) To evolve a white seeded strain ; and
(iii) To improve the shelling outturn of T.M.V. 1 strain.

The hybrid seeds were collected and preserved along with those of the parents.

The progenies of earlier crosses were raised and studied and thirty-one single plant selections were made from them. Among 61 selections from progenies of crosses, 22 were found promising. Work was in progress since 1950–51 and has to be continued.

Rotation experiment.—The experiment to determine the effect of growing groundnut in rotation with millets was continued for the ninth year with groundnut and the three millets grown in rotation. The differences in yield among the rotations were not statistically significant. However millets

following groundnut yield 20 to 46 per cent more than millets following millets. Groundnut cereal rotations are being popularized by propaganda and demonstration. This will help to increase millets production of the State.

Cultural experiment.—This experiment was continued with the same tillage treatments and layout as in previous years. There were no significant differences between the different tillage treatments in regard to the yield or quality of produce.

Manurial experiment.—This experiment, started in 1948-49 with the object of determining the optimum dose of potash and phosphoric acid to be applied to groundnut, was continued for the sixth year in succession. The results showed that 75 lb. of K_2O per acre with a basal dressing of cattle manure at five tons per acre significantly increased the yield of groundnut while the application of phosphoric acid had depressing effect on the crop. The results will be published for adoption by cultivators as application of the optimum manures ensure high yields.

Mixed cropping experiments—Rainfed trial.—This experiment designed for fixing up a suitable strain of cotton for being grown mixed with groundnut was repeated with the same four strains of cotton grown as mixture with groundnut. The results obtained during the year were not conclusive.

Spacing trials—For determining optimum spacing—Rainfed trial.—Preliminary trials indicated that wider spacing between rows up to 18 inches and closer spacing of plants in the row up to 3 inches instead of the normal spacing of 9 inches × 9 inches have not only affected the yields but have resulted in considerable saving in the cultivation charges by facilitating inter-cultivation with bullock drawn implements. Results are to be confirmed by further trials.

Groundnut drying experiment designed for determining optimum temperature for drying.—Drying groundnuts with initial moisture content of 40 per cent and 50 per cent at 40°C gave the maximum germination. Drying at 60°C reduced the germination. This is in conformity with the results obtained last year.

Breaking the dormancy of spreading varieties of groundnut.—Soaking the kernels of the spreading type of groundnut in ethylene Chlorhydrin (0·7 per cent) and in dichlorophenoxy acetic acid (50 BPM.) gave the highest germination over the same chemicals in other strengths and over other chemicals. These two chemicals have thus proved useful in breaking the dormancy of the spreading type of groundnut. The results will be useful where freshly harvested spreading groundnut have to be sown again.

Control of earwig attack on groundnut.—The trial was repeated during the year with the two insecticides DDT. 5 per cent and BHC. 5 per cent applied to a crop of TMV. 3 groundnut at 30 lb. per acre in two applications, viz., two months and three and a half months after sowing the crop. The results showed that both the insecticides are effective in preventing damage to groundnut pods by the pest. Results are to be confirmed by further trials.

District trials.—Five bunch pure lines and four semi-spreading strains were under trial in the different districts. The dorment bunch strain A.H. 6481 again gave encouraging results in two centres in the Pollachi tract. Two bunch pure lines at Coimbatore, and five at Koilpatti were superior to TMV. 3 strain. Among the four semi-spreading strains, two, viz., A.H. 6614 and A.H. 6608, were superior to the standard strains at Coimbatore. Seeds of these four semi-spreading strains and four new edible strains were multiplied and supplied for trial in Tiruchirappalli.

Gingelly.—Research work on gingelly was continued with the main object of evolving high yielding strains with desirable economic characters like short duration, high oil content, white colour of seed, suitability for growing in different seasons, etc.

Cold weather crop 1953–54.—Selection work was in progress.

Hybridization.—Four new crosses were effected with the object of evolving a cosmopolitan type. The F. 1 progenies were raised in 1954 summer.

Summer (Irrigated) crop, 1954—*Comparative yield trials.*—Two selections from the varieties 'Local' and 'Karur' were compared with the local TMV. 1 and TMV. 3 strains.

New varieties.—Five local varieties were grown and 17 single-plant selections made from them. A white seeded variety from Pakistan was grown and five single plant selections made. Ten cultures of *Sesamum orientale* received from the Indian Agricultural Research Institute, New Delhi, were raised in pot cultures. Two among these were early flowering types.

Hybridization.—Eighteen fresh crosses were effected and the progenies of earlier crosses were also raised and studied.

Time of sowing experiment.—The experiment to find out the optimum time of sowing summer gingelly was repeated for confirmation of results obtained last year. The harvest of the last sowing is not yet completed. The data collected on the growth and flowering of the crop show that early sowings in February are definitely advantageous. The yields are also expected to follow the same trends.

Deterioration of gingelly seeds under storage.—The experiment was continued since 1951-52. After six months storage, it was found that there was slight increase in acidity in all the samples and mild infestation of pests in the tin and earthen pot. Seeds kept better in glass bottles and gunnies. After eleven months' storage, maximum reduction in viability and increase in acidity occurred in the stored seeds and maximum reduction on oil content and increase in pest infestation took place in seeds stored in earthen pot. The results will be passed on to the cultivators.

Castor—Improved strains.—There was good demand from the districts for the seeds of the produce of the zonal nucleus seed farms. Seeds of the improved strains were supplied to the States of Hyderabad, Madya Bharat and Madya Pradesh.

Experiments and research.—Research work on castor was continued with the object of evolving strains with high yield, early maturity, high oil content, non-shattering nature of capsules and resistance to the semi-looper pest, etc.

Collection and testing of new varieties.—The three varieties of castor obtained from Bombay, Uttar Pradesh and Madya Pradesh were compared with the local strains for the third time. The extra State varieties yielded significantly less than the strains TMV. 1 and TMV. 2. Five varieties of castor obtained from the U.S.A. were raised and studied in observation plots. Two among these, viz., Baker 195 feet and 'Cimmarron' were found to possess desirable economic characters like very short duration, profuse branching and large number of fruit clusters.

Comparative yield trials.—Five selections from the progenies of a cross (Namakkal irrigated × Kumbakonam) were compared with the strains TMV. 1 and TMV. 2. All the selections yielded on a par with TMV. 2 but less than TMV. 1 strain. All the selections were, however, shorter in duration than the standard strains by over a month.

Hybridization.—Ten new crosses were effected with the object of (i) reducing the duration of the existing strains, (ii) imparting distinct colour to the strains for easy identification and (iii) studying the inheritance of the character of number of nodes to first inflorescence. The hybrid seeds were collected. The progenies of earlier crosses were raised and studied and eleven single-plant selections were made from them. Ten selections from the progenies of crosses were under test. In regard to the character of number of nodes to the first inflorencence, the hybrids of the short duration South African type and the strains were intermediate but leaning slightly towards the short duration type. Work is to be continued.

Ornamental types.—The purity of the eight ornamental types was maintained by using selfed seeds. Pure selfed seeds were supplied to the districts for popularizing these types among the public.

Spacing trials.—The results of the experiment repeated during the year with the South African variety of castor, showed that closer spacings give significantly higher yield than wider spacings, the maximum yield being obtained from the closest spacing of 1 foot × 1 foot. Work is to be continued.

Control of the semilooper pest—Evolving types resistant to the pest.—Observations were continued on the varieties and types of castor which exhibited resistance to the semi-looper pest. The observation made last year that plants having dark green leaves with red tinge on the mid ribs were less susceptible to attack by the pest was confirmed during the year.

Insecticidal and biological control.—Spraying D.D.T. (0·2 per cent) and B.H.C. (0·08 per cent) was found to be very effective in controlling the semi-looper pest in the early stages of infestation. Work has been in progress since 1951–52. Results require to be confirmed by further trials.

Coconut—Experiments and research.—Research work on the coconut was continued with the main object of determining the optimum and economical cultivation and manuring practices to be adopted for bearing coconut trees and breeding high yielding types.

Manurial experiments.—The experiment started in 1948 to find out the best method of applying manures was continued. There were no significant differences between the different methods of application. In the experiment to find out the best potassic fertilizer to effectively replace ash, there were no significant differences between the treatments in regard to the yield of nuts, indicating that ash can be replaced by potassium sulphate or muriate of potash on equivalent K_2O basis.

Cultural experiments.—In the experiment started in 1942 and 1948 to find out the best cultural treatment and the optimum depth of cultivation for coconut gardens, no significant differences were observed between the different treatments in the yield of nuts. However, the maximum net return was obtained in the treatment 'Ploughing thrice'.

Depth of planting experiment.—Among the coconut seedlings planted in 3 feet and 6 feet deep pits, the growth and flowering of the seedlings show decided advantage in favour of 3 feet deep planting. The results can be recommended for adoption only after the trees come to normal bearing.

Trial of green manure and subsidiary crops.—Among the various green manure crops, other than *Crotalaria striata*, which were tried, *Peuraria phaseoloides* and *Calopogonium mucunoides* were found to be the best green manure-*cum*-cover crops for the coconut garden.

Of the subsidiary crops tried, groundnut, sweet potato, and tapioca gave the best monetary return. Work was in progress since 1948–49 and is to be continued.

Coconut breeding for evolving high yielding types.—The progenies of the various intra and inter-varietal crosses were under observation. The progenies of the tall × dwarf were the most outstanding. The F_2 progenies of this cross were also quite vigorous. Progenies of crosses involving high yield, high female flower production and thick meat and progenies of the crosses Laccadive × Chowghat dwarf and Strait Settlements × Andaman dwarf were promising. A total of 3,401 hybrid seed coconuts of the tall × dwarf which were cross pollinated last year were harvested and sown in the nursery. A total of 814 inflorescence of the tall were cross pollinated with pollen from the dwarf. A new cross was effected between the west Coast tall and the spikeless variety. Work has been in progress since 1943–44. Large number of tall × dwarf hybrid seedlings are being produced and distributed to growers. The planting of these is expected to bring in an additional yield of over 1,400 nuts per acre.

Study of exotic varieties of coconut.—Observations on the various palm characters of the exotic varieties were continued. The varieties Laccadive ordinary, Laccadive small, Andaman ordinary, Phillipines and Cochin China, continued to be promising. A few more varieties, viz., the Bansa hybrid, San Ramon, Tambili, Gonthambili and Nawasi were introduced and the seedlings were under observation.

Deterioration of coconut oil on storage.—Coconut oil stored, in different containers and after various treatments showed at the end of 12 and 18 months' storage that (i) maximum acidity developed in the oil boiled with tamarind and minimum in the oil heated at 90°C and stored and (ii) at the end of 18 months' storage, oil stored in green and yellow coloured bottles and in aluminium vessel developed the least acidity.

Seed multiplication schemes.—The following seed multiplication schemes were in progress during the period :—

Comprehensive Coconut Nursery Scheme.—This scheme as originally sanctioned for a period of five years and started on 10th November 1948, terminated on 9th November 1953. The scheme was extended for a further period with five centres, viz., Nileshwar, Badagara, Pattambi, Pattukkottai and Samalkot. The nursery at Samalkot went over to Andhra State from 1st October 1953. During the period under report, 6,610 mother palms were selected for collection of seednuts. A total of 110,600 nuts were obtained from these palms from March to May 1954 for planting at Nileshwar, Badagara, and Pattukkottai centres. Up to the end of June 1954, 45,400 seed nuts were planted at the above centres including 7,000 planted at the Agricultural Research Station, Pattambi, for raising a small nursery. Out of 134,277 seednuts planted in the 1953 nursery at Nileshwar, Pattambi and Pattukkottai, 124,767 seednuts sprouted, registering a germination percentage of 93·6. A total of 100,500 selected seedlings are estimated to become available for distribution during 1954 planting season. During the period under report, 46,124 selected seedlings were supplied from the 1952 and 1953 nurseries to the public.

Coconut Nursery Scheme, Marudur (Tiruchirappalli district).—The scheme was started on 29th April 1950 and is due to terminate on 30th September 1954 after a period of over four years. No seednuts were procured for planting in 1954. In the 1953 nursery 7,233 out of the 8,000 seednuts sown sprouted registering a germination percentage of 90·4 about 6,000 selected seedlings are expected to become available for distribution during 1954 season.

During the period under report, a total of 4,537 seedlings were supplied to growers and other departments.

Scheme for the multiplication of improved strains of groundnut and castor.—Consequent on separation of Andhra State, the seed farms at Vayalpad and Adoni went over to the new State from 1st October 1953. At Pollachi Srivilliputtur and Tindivanam, the crops suffered due to uneven distribution of rainfall and recorded low yields. A total of 120,549 lb. of picked seed pods of groundnut and 3,354 lb. of picked beans of castor were obtained.

Seed distribution.—The following quantities of improved seeds and seedlings were distributed during the year :—

Variety.	Quantity distributed.	Estimated area covered.	Additional production estimated.	Economic gain.
	LBS.	ACS.	TONS.	RS.
Groundnut pods	93,080	860	65	33,750
Groundnut kernels	1,140			
Gingelly seeds	1,901	475	12	11,000
Caster seeds	1,500	150	8	5,750
Coconut seedlings	52,263 (Nos.)	750	330 (Copra.)	1,35,000

(*d*) *Cotton.*

I. *Research.*—Cotton improvement work in Madras State is comprehensive, including in its scope, factors of yield and quality and buidling up resistance to pests, diseases and drought in all the important commercial varieties cultivated in this State. In addition to existing commercial cotton zones, new areas like off-seasonal fallows in rice lands of Tanjore delta and Coastal districts of Malabar and South Kanara are being tackled for the introduction and cultivation of suitable American and Sea Island cottons respectively.

The maintenance of purity, multiplication and distribution of improved strains also engage the attention under special schemes run for the purpose. Another important items of work is the certification, under a separate organization, of superior cottons (Madras Cambodia Uganda-1 and Madras Cambodia Uganda-2) exempted from price control by the Textile Commissioner, Bombay.

Most of the research items mentioned above are being tackled under separate schemes financed partly by the Indian Central Cotton Committee. The salient features of progress in research during the period under each of the breeding progress are given below :—

(1) *Irrigated winter Cambodia* (*Cotton Breeding Station, Coimbatore and Cotton Breeding Centres at Avanashi and Tiruchengode*).—The object of this item of research is the evolution of a long staple American cotton variety with a minimum staple of 1⅛ inches, ginning percentage of 38 and suited for cultivation under irrigation in the Cambodia cotton growing areas of the Central and Southern districts of the Madras State. From a review of the results obtained from the co-ordinated yield trials conducted over five years with the best cultures on hand, it was found that culture 9030 was an improvement over the standard strain Madras Cambodia Udanga-1 yielding about 8 per cent of lint over the latter with the same spinning capacity. This extra lint is expected to fetch Rs. 40 per acre. It remains to be multiplied and tested in the district before distribution to the cultivators. Trials in the regional stations revealed three other cultures also to be better yielders than Madras Cambodia Uganda-1 combining better length as well.

(2) *Irrigated summer Cambodia* (*Cotton Research Centre, Srivilliputtur and Agricultural Research Station, Palur*).—The aim of this item of research is the evolution of early maturing cottons of long staple (1⅛ inches and above) suited for summer tract and the evolution of *barbadense* varieties or their hybrids suitable for cultivation in the coastal belts of South Arcot district. The work has been in progress for four years. Three cultures that proved their merit in the bulk yield trials were arranged to be tested against the existing strains Madras Cambodia Uganda-1 and Madras Cambodia Uganda-2 on cultivators' holdings for the first time during 1953 summer. Of the fifteen cultures tested in the bulk yield trial three cultures excelled the control Madras Cambodia Uganda-1 in yield of which two combined superior halo length also. Fibre length as high as 1·17 inches compared to 1·06 inches of the control has been recorded by one culture. The trial of Madras Cambodia Uganda-2 in the South Arcot district during 1953 summer indicated the superiority of Madras Cambodia Uganda-2 over Madras Cambodia Uganda-1 in earliness, yield and quality. By cultivating MCU 2 ryots can harvest the cotton crop yearly, save one irrigation and get an increase of Rs. 5 to 10 per pothi (280 lb.) over MCU 1. The value of such benefit over 60,000 acres is estimated at 12 lakhs of rupees.

(3) *Unirrigated American cotton for the Central and Southern districts* (*Cotton Research Centre, Periakulam*).—This item of work has for its object the evolution of a strain of Cambodia cotton suitable for growing in the districts of Coimbatore, Salem, Madurai and Tiruchirappalli under rainfed conditions and capable of giving a good yield with a staple of 15/16 inches and above. A new culture, Rs. 9,030–8–5 which was developed from the breeding material obtained from Coimbatore was found to record significantly better yield than the best control, Madras Cambodia Uganda-2. Another noteworthy culture was P. 241 with good halo length. The performance of Madras Cambodia Uganda-2 was also noticed to be consistent with its past behaviour. Research work has been in progress for four years and has to be continued.

(4) *Unirrigated Sea Island cotton* (*Agricultural Research Stations, Pattambi and Paddy Breeding Station, Mangalore*).—The research work here aims at the acclimatization of Sea Island, the world's finest cotton, in the West Coast districts of Malabar and South Kanara as a raingrown crop in the 'Modan' and 'Kumeri' lands. The results of the past five seasons disclosed that yield levels were on an average higher at Pattambi than at Mangalore. It was also found that cropping of Sea Island as an inter-crop in the coconut gardens would not fetch economic returns. The necessity to reduce the cost of cultivation was indicated. Further work was therefore modified not only to achieve the above objective but also to grade down the staple of Sea Island Montserrat to a level that would suit the requirements of the Indian Mills. The Research centre at Nileshwar was closed since the inter-cropping trials were discontinued. Breeding trials were confined to Pattambi while the other trails were extended to Mangalore also. Confirmatory evidence was obtained on the advantage of transplanting seedlings raised prior to the monsoon in order to obtain higher yields. This method almost doubled the yield obtained by raising seed sown crops. From the manurial trials the conclusion was that 40 to 60 lb. of nitrogen when applied as a top dressing over a basal dose of 3 tons of cattle manure, 150 lb. of super, 100 lb of potash and 550 lb. of lime maximized the yield even up to 850 lb. of kapas per acre. Interspecific F. 1's of Sea Island and Co. 2 were found to register high level of yields and as ratoons they gave still higher yields. New varieties like

Andrews, Westberry, Sea Brooke and White flower have indicated their adaptability with high ginning percentage and moderate length. One hundred and seven pounds of Sea Island seeds have been supplied to 17 Agricultural Demonstrators for conducting trials on cultivator's holding.

(5) (*a*) *Unirrigated Karunganni* (*Cotton Breeding Station, Coimbatore*).—It is the object of this work to evolve Karunganni strains superior to Karunganni–5, the existing strains, in ginning percentage and lint quality. Almost a similar objective is aimed at by the work, done at Koilpatti where it is sought to evolve strains of Karunganni cotton capable of spinning 40's standard warp counts and suited to the entire area in the Central and Southern districts of Madras State where unirrigated desi type of cotton is cultivated. Work has been in progress for four years. Two culture were found to be promising.

(*b*) *Unirrigated Tinnevellies* (*Agricultural Research Station, Koilpatti*).—As mentioned under 5 (*a*) the object of the work here is to evolve strains of Karunganni cotton capable of spinning 40's standard war counts and suited to the entire rainfed *desi* cotton growing blacksoil areas of the Central and Southern districts. The district trials with the best four cultures that have a spinning capacity ranging from 35's to 41's as against 30's of the best existing strain Karunganni-5, were repeated for the second time during this year also, in 20 locations in the Central and Southern districts. Though the final yield data are yet to come from the Southern districts, the results so far obtained are indicative of their adaptability to the different tracts. Among them two cultures, viz., 6186 and 6874 would appear to be preferable to the other two. Work has been in progress for five years, and district trials pursued to release a better strain to replace the existing one K.5.

(6) *Unirrigated Nadam cotton* (*Cotton Breeding Station, Coimbatore*).—The object here is to evolve an early maturing *desi* type of cotton of medium staple that can replace the existing coarse, perennial Nadam cotton which is cultivated on the poor, gravelley soils of the Erode taluk of Coimbatore district. The magnitude of the problem got considerably reduced with the inauguration of the Lower Bhavani Project which has enabled the transformation of this tract into an irrigated area. However, the work was pursued on a limited scale with a view to utilize the existing breeding material for introduction into the small pockets in the tract that would still be cultivating Nadam cotton. Work was initiated at the Agricultural Research Station at Satyamangalam which is more or less representative of the Nadam tract. Observation plots were laid out here with the best two cultures isolated at Coimbatore and comparison was made against local Nadam. The results have been in favour of the cultures but the performance has to be watched in the Second Year for confirmation. At Coimbatore four selections in the progeny rows were found to be better than the best culture B. 32·48 in halo length and ginning percent. A few first and second generation hybrids have also been found to be desirable with regard to halo length. Work has been in progress for four years and has to be continued.

(7) *Perennial cottons*.—The work on perennial cottons aims at selection of suitable types which can be easily grown in backyards of houses, vacant sites, along bunds and water courses and in fact every waste area and thus increase the production of raw cotton with least disturbance to the area under food crops. The variety that is distributed at present is Moco. Since this variety was found to be heterozygous in its characters its purification was undertaken and two pure breeding isolations were made. Caramura, and another perennial type sent by the Director of Agriculture, Madras, which was found to possess a fibre length as high as 1·33 inches with a ginning per cent of 34, were under trial. Work has been in progress for four years and 38 lb. of Moco seeds have been supplied to interested parties for cultivation. These may help to meet domestic requirements.

(8) *Wild cottons* (*Cotton Breeding Station, Coimbatore*).—The object of this research work is the transference of qualities like resistance to diseases and pests and fineness of lint possessed by wild cottons to cultivated types that lack these attributes. Progenies derived from multiple crosses involving select wild cotton types and cultivated varieties like Madras Cambodia Uganda-1, Madras Cambodia Uganda-2, 4463 H.19 and 1908 were studied in replicated rows and despite the paucity of water-supply three selections were found to have yielded significantly better than the control. Cultures combining good yield, halo length and ginning percent were also noted in crosses involving Madras Cambodia Uganda-1 and Madras Cambodia Uganda-2. Work has been in progress for four years and has to be continued.

(9) *Studies on inheritance of characters in cotton* (*fundamental studies at Cotton Breeding Station, Coimbatore*).—It is with the object of accruing further knowledge on the heritable behaviour of the various mutants in cotton that this item is pursued. A wide range of mutants covering authocyanin pigmentation, plant-habit boll-dehiscence, meristic variation and lint characters were maintained and studied. From a study of the population in the first back cross and second generations of the crosses of fine linted type with coarse types, it appeared that 'fineness' of fibre was controlled by more than one gene. Crosses were made between a 'meristic variant' type and two other mutant forms, viz., 'Pistillate' and 'Green-stem-ghost spot' for a study of their relationship in inheritance. Crosses were also made between two new dwarf types and other normal types for studying their behaviour in the first and subsequent generations. The work will be pursued continuously for acquisition of knowledge which can be applied in breeding work.

(10) *Study of heterosis and vegetative propagation* (*Cotton Breeding Station, Coimbatore*).—The object of this item is to study the manifestation of hybrid vigour in the first generation hybrids of different crosses and explore the possibility of harnessing the same in the subsequent years by propagation adopting vegetative methods. One hybrid between Cambodia 2 a hardy, vigorous, medium quality Cambodia strain and S.I.V. 135, the world's finest cotton, was found to exhibit heterosis inyield of seed cotton. The propagation of this hybrid from stem cuttings was attempted and partial success was obtained. However, the percentage of establishment was low in the cuttings which was largely due to inadequate irrigation facilities. The hybrid was also treated as a ratoon and the performance was encouraging in that, the level of yield was still higher in the ratoon than in the first year crop. Apart from this hybrid, six first generation hybrids involving perennial cotton types were also studied. Among these the cross between Moco × Quebradinho was found to be the best, registering significantly better values in all the three economic characters, yield, length and ginning. Further research is necessary before recommending for adoption by ryots.

(11) *Trials on grafting of cotton* (*Cotton Breeding Station, Coimbatore and Agricultural Research Station, Pattambi*).—With the object of maintaining rare and delicate varieties by grafting them on hardy indigenous stocks, this piece of work was initiated during the year. A long stapled Egyptian variety

'Karnak' which was susceptible to Jassids was grafted on the Javilla. The work was taken up at the request of the Indian Central Cotton Committee.

(12) *Cotton in rice fallows* (*Agriculturul Research Stations, Aduthurai, Palur and Central Farm, Coimbatore*).—The object of the work is to evolve an early American variety of medium quality to be grown in the rice fallows in deltaic and non-deltaic areas of Madras State. Though the scheme has been sanctioned by the Indian Central Cotton Committee for this item of research, the work is continued from State funds pending receipt of orders from the Government. The existing variety is the Punjab American type, P.216.F. From the varietal trials conducted during the year, it was found that Coker, a long stapled American variety at Aduthurai and Madras Cambodia Uganda-2 at Coimbatore fared significantly better than P.216.F. P. 23. F. another Punjab American type was observed to be earlier than P.216.F. These varieties are being once again tested for conelusive results. For the production of pure seeds of P.216.F. a seed nucelus plot has been arranged at Aduthurai. In a spacing trial conducted during the season, closer spacking of 1½ feet by 4½ inches was found to result in increase of yield up to 30 per cent and more. P.216F. is already under distribution in Tanjore district for cultivation in rice fallow. A better type is yet to be found and research work has to be continued for this purpose.

Besides the above breeding projects, a scheme for the certification of Superior cottons, viz., Madras, Cambodia Uganda-1 and Madras Cambodia Uganda-2 which are exempt from price control, continued to function with headquarters at Rajapalayam. It provides an organisation for the inspection of the crops and produce of Uganda cottons and issue of certificates of purity which will help the cultivators and traders to obtain better prices for these superior cottons in the market. This scheme is entirely financed by the State Government.

II. The following Seed Multiplication and Distribution Schemes only were run during the year :—

(*a*) The scheme for the multiplication and distribution of Madras Cambodia Uganda-1 and Karunganni-5 cotton at Tiruppur.

(*b*) The scheme for the multiplication and distribution of Karunganni-2 Madras Cambodia Uganda-1 and Madras Cambodia Uganda-2 cotton seeds at Koilpatti.

Besides the above, seed nucleus plots for Cambodia-2 Madras Cambodia Uganda-1 and Karunganni-5 at Coimbatore and Karunganni-2 Madras Cambodia Uganda-1 and Madras Cambodia Ugands-2 at Koilpatti were maintained under a separate scheme financed by the State Government.

III. *Total quantity of seeds of improved strains distributed during the period from 1st October 1953 to 30th June 1954:—*

	Maunds (82-2-7 lb.)
Madras Cambodia Uganda-1 (Winter)	91
Madras Cambodia Uganda-1 and Madras Cambodia Uganda-2 (Summer).	9,746
Karunganni-2	7,273
Karunganni-5	2,066

IV. The probable economic gain on modest estimates to the growers of improved strains of cotton under distribution in this State is furnished in the statement below :—

Improved strain.	Extra lint yield in pounds per acre.	Additional income per acre.	Probable area covered acres (000's 1953-54).	stimated extra income for the State.
				RS. LAKHS.
Cambodia 2	30	42	42·5	17·9
M.C.U.I.	27	55	95·2	52·3
M.C.U. 2	27	55	0·26	0·14
Karunganni 2	23	30	217·8	65·3
Karunganni 5	35	40	117·7	47·1
Total ..			473·46	182·74

(*e*) *Sugarcane.*

Sugarcane varietal trials (*Gudiyattam*).—The object of the trials is to select high yielding varieties to replace existing ones.

Among the new cane varieties, received from the Sugarcane Breeding Institute, Coimbatore, and tested at this staton, six promising varieties for early season crush and six varieties for late season crush, were selected and promoted for further trials before release to the ryots.

Among the early varieties studied in the Preliminary yield trials, four promising ones were selected and carried over for their final yield trials, Co. 527, Co. 449 and Co. 419 continue to be the best canes for early, mid and late seasons. Planting in January and harvesting in March recorded highest cane yield and commercial sugar per acre. Next to this crop planted in May and harvested at the age of 10 months was found to be better. In respect of sugar per acre 10 months old crop planted in May was found better than the 14 months old crop planted in January. Variety Co. 449 was found to be better than Co. 419 under all conditions. This variety is already under distribution. This work is continuous and has to be continued as new cocanes are released from the Sugarcane Breeding Institute, Coimbatore.

Trial of Rayungans.—The object of the trials is to see if seed material used for planting could be reduced. Rayungans as seed material did not indicate utility of this method for wider adoption. Rayungans in combination with short cropping is noted to be a very rapid method of propagation of cane varieties. Multiplication rate of over 600 times in a year can be achieved as compared to 60—100 times by short crop alone. Reduction in seed material is an important item. The work was started in 1952–53 and is being continued for confirmatory results.

Lodging.—Lodging in canes was found to affect both yield and quality of canes. This is found to be more so in Co. 419 than Co· 449. Planting canes in deep trenches, banking high, and propping the canes by the trash twist method, reduces loss by lodging to a considerable extent. Due to lodging, canes, break at the bottom. The canes so broken dry up, resulting in loss of yield of cane and sugar. Co. 419 breaks more severely compared to Co. 449. So in places where lodging is severe, Co. 449 is recommended as the best variety for planting. The results were passed on to the sugarcane extension staff for propaganda.

Jaggery.—To get gur (jaggery) of good structure and colour, clarification of juice with lime and water extract of Bendai stalks, adjusting the PH of the clarified juice to 6 PH is recommended. The PH can be easily tested by the indicator papers. For over aged crop addition of excess of lime, with consequent loss in colour was found necesary to set the gur to fair consistency. Work is being continued as work was commenced during the year only.

Seed distribution.—Sugarcane setts distributed.—54,819 lb.

Sugarcane Liaison Farms.—These farms were started with the object of testing under local conditions, the results achieved in research in the Sugarcane Research Station. There were only two farms one at Nellikuppam and another at Kulittalai after the separation of Andhra State.

(*a*) *Nellikuppam.*—In the varietal trials Co. 658 recorded the maximum CCS of 6.19 tons per acre and holds promise as an early cane. For the mid season Co. 449 and Co. 419 were found better than Co. 349 the variety under-spread. For the late season Co. 419 proved to be the best.

In the manurial trials ammonium sulphate was found to be better than Chilean Nitrate. Applications of press mud (a waste product for sugar factories) was found beneficial and is being advocated for application, with holding water prior to harvest after normal irrigations during the growth period was found to induce better quality in juice. Periodical monthly plantings to determine suitable planting months were continued.

(*b*) *Kulittalai.*—In the main season early planting trial Co.419 yielded (39 tons per acre) better than Co. 449 (32·8 tons per acre) though the juice quality of the latter was better Co. 467 yielded over 40 tons with 5 tons CCS per acre and was released for distribution as it was found to be free from Smut disease. Ammonium sulphate was found to be superior to Chilean Nitrate. In planting trials with three standarad varieties Co. 419, Co. 449 and Co. 527 it was found possible to increase sugar recovery by suitable adjustment of planting and harvest of these varieties. This is already being advocated to growers.

(*f*) *Horticulture.*

Research—Fruits—Mango.—A hybridisation programme was newly chalked out with the varieties represented in the collection at Taliparamba and at the end of the year 613 crosses had been effected of which 18 proved successful. Stones of these were sown for raising hybrid progenies.

Mandarin orange.—Among the seedling and clonal progenies of 23 parental types assembled from representative mandarin growing tracts at Kallar, the selections, viz., Poona Sangtra, Nagpur Sangtra, Kookal and Kolakombay yielded their first fruit in the year. In the rootstock trials for mandarin orange at Kallar and Wynaad, Jamberi accounted for the maximum tree growth. The large number of casualties on sweet lime stock points to its relative unsuitability for the mandarin scion. Hybrid seedlings representing five different inter-specific combinations among mandarin orange, pummelo, lemon and grape fruit as well as selfed seedlings of a selected tree of Kallar mandarin were planted out in the field for observation. At Wynaad, mandarin trees which were manured and mulched put on more growth and were able to withstand drought better than others.

Apple.—Two mixed American apple varieties stood out during the year as of promise. Among the five root stocks under trial for Rome Beauty Merton 779 and 778 accounted for greater tree vigour while grafts on crab stock were leading in respect of yield. Thirteen varieties from Auckland and four hybrid types from Israel introduced in the previous year were established in the field. The results of the spray trials with Sandolin 'A' which were repeated confirmed its efficacy in inducing early blossoming and promoting yields in apples.

Plum.—In the roctstock trial with seedling stocks of plums and the common peach for the two scion varieties Czar and Gaviota, increasing stock scion incompatibility in all the combinations was perceptible. The least distortion at bud-joint was recorded by the grafts of Gaviota on Alu Bokhara. On gernal considerations, therefore, none of the plum seedling rootstocks were found to be more suitable than the erstwhile common peach for the plum scion. Top working choice but shy bearing varieties, viz., Shiro and Abundance with suitable pollinisers, Hale and Kotagiri respectively recorded in their sixth year of bearing yields representing 99·8 and 118·5 per cent increases over those trees which were situated away from the pollinisers.

Peach.—Among the common peach seedling stocks of three different age groups, eight-month old stocks continued to foster greater vigour and higher yields of the two scion varieties, Red Shanghai and Shanghai seedling.

Jack.—The use of 'Alkathene' wrappers accompanied by the application of Seradix B.3 to cinctured shoots did not prove to be a successful method for the vegetative propagation of jack. In the rootstock trial at Kallar, the grafts on Rudrakshi continued to be most vigorous. The grafts on Rudrakshi as well as ordinary jack seedling stocks flowered for the first time after seven years from planting which appears to be *an usually* long period for vegetatively propagated plants. The reasons for this are not very clear and fresh batches of grafts made subsequently under known conditions are under observation. In the progeny trial at Burlier, Puthur and Taliparamba selections among seedlings and Burliar Estate No. 1. and Thyagarayanagar selections among clones were leading in respect of tree vigour. At Taliparamba crosses involving two parental combinations, noted for their soft and hard flakes were made. The hybrid seedlings that resulted are awaiting planting.

Annonaceous Fruits.—In the rootstock trial with four rootstocks for the custard apple, bull's heart was adjudged to be relatively the best on considerations of tree vigour, yield and stionic compatibility while soursop and A. palustris stocks proved unsuitable. Hybrid progenies that resulted from crosses between custard apple, soursop and cherimoyar were raised and planted of which one seedling from the combination custard apple ♀ × cherimoyer ♂ flowered within the year. The new introductions at Coimbatore comprising annona types from Chile, Israel, Hyderabad, Anakapalle and one hybrid from Poona made satisfactory progress. In the cherimoyer plots at Coonoor, grafts put on relatively more growth than seedlings in the same period after planting though there were no perceptible difference in bearing. An introduction from United States of America and one farm selection showed promise in respect of individual fruit size and quality respectively.

Sapota.—Fifteen hybrid seedlings resulted from crosses between Cricket Ball and oval varieties at Coimbatore. In a rootstock trial for sapota at Taliparamba, trees on *Mimusops hexandra* accounted for maximum growth whereas grafts on *Madhuca longifolia* exhibited early signs of incompatibility.

Pineapple.—In the preliminary trials at Kallar and Wynaad to obtain staggered harvests of pineapples the indications were that the application of a 0·001 per cent solution of alpha-napthalene acetic acid advanced flowering by about two months while at 0·1 per cent concentration the harvests were put off by about six months. On the basis of these results, a comprehensive trial was chalked out for pursuit at Wynaad and Taliparamba where facilities

for such work on an extended scale are available. Hybridisation work with the two varieties, Kew and Mauritius at Kallar did not meet with success as the resulting fruits were seedless.

Papaya.—In breeding for purification of selected lines through sib-mating was continued at the College Orchard. The named type Ranchi attained purity in the year and efforts were put under way for large scale, multiplication of its seeds.

Intensive Research work in Horticulture has been in progress at Coonoor, Kallar and Burlier for over nine years and College Orchard five years. Introduction and trial of new varieties, hybridisation to combine desirable character of reputed varieties, propagation trials to determine optimum method of propagation, *manual* and cultural trials to determine optimum cultural schedules were the items of research. Improved varieties of fruits, etc., were made available to the public as per details given in paragraph—supply of plants.

Cashew.—The Assistant Fruit Specialist (Cashew) surveyed the plantations in the major cashew growing areas of the state and selected 96 promising individual trees for seed collection and establishment of a progeny plot. Seeds of exotic types from East Africa and Brazil were obtained and put under trial. In vegetative propagation trials cincturing was newly determined to be of promise in rooting of shoots. Layering by the ordinary processes was also successful. Research was initiated during the year under a scheme partly financed by Indian Council of Agricultural Research.

Vegetables.—The improvement work on brinjal and bhendi was pursued on planned lines and single plant selections were made for purification and breeding purposes. Two bhendi selections 'Indian Bhendi' and 'College Orchards' emerged as high yielders. Detailed descriptions of the selections were made with a view to evolve a key for the classification and identification of the types grown. Hybridisation in the case of brinjals was confined to the five types received from the Indian Agricultural Research Institute, New Delhi and trial to exploit hybrid vigour revealed that the crosses generally yielded more than one or the other of the parents involved but not over both. A scheme partly financed by the Indian Council of Agricultural Research was sanctioned and preliminaries for starting work have been taken.

Cardamom.—The survey of the cardamom growing areas of South India was completed and detailed information on cardamom cultivation practices was gathered. Desirable economic features of the several types obatined from the different regions were listed out with a view to make further selections. One hundred and twenty (120) selections from the indigenous cardamom of the Singampatti hills were examined for yields and promising selections yielding from two to five times over the cultivated bulk cardamom were isolated. Thre of ethese outstanding selections are Nos. 71, 79 and 81 yielding as they do five times over the bulk crops. Two selection Nos. 39 and 71 were found to be thrips resistant. Eight inch long rhizomes advance production of clumps by about seven months over one inch long rhizomes used as planting material. In a trial with fertilisers and trace elements, it was seen that cardamom responded to nitrogen, potash and manganese. Research work was carried on at Singampatti Hills financed partly by Indian Council of Agricultural Research for the past seven years. *Varieties* hybridisation between desirable ones, agronomic practices for improving yields, plant protection measures to control pests and diseases were under reserach. The scheme was closed during the year and the desirable selections were sent to Burlier for future work in Anamalais.

Autoxone dusting at 1 : 500 strength was found to control Cardamom thrips and this control measure can be passed on to *cultures* and planters for adoption.

Pepper.—A technique for controlled pollination was devised and hybridisation work with three varieties and one wild species, *P. attenuatum* was put underway. It was newly determined that pepper could be inarched to other varieties and wild types. Using this method grafts of Kalluvally and Balankotta varieties on Uthirankotta and *P. attenatum* were raised for planting a rootstock trial. Preliminary indications were obtained that spraying with a solution of 2, 4-D at 20 parts per million reduced spike shedding. Research work in pepper has been in progress at the Pepper Research Station, Panniyur, for the past three years including such items as varietal studies for detaining desirable types, hybridisation between desirable varieties *manual* and cultural studies, studies on wild and spike shedding, rootstock trial, top working and economic of cultivation. Further research work is needed for confirming results obtained before passing them on to cultivators.

Ginger.—An early planting of the rhizomes on 1st of May assisted the crop to better performance than latter plantings. Provision of artificial shade and mulching twice with straw promoted higher yields. Storing of the seed rhizomes in pits over a layer of sand and paddy husk and under aerobic conditions gave greater recovery.

Other spices.—Propagation trials have indicated the feasibility of raising grafts of clove and nutmeg on their own seedling stock. Nutmeg further was successfully inarched for the first time on *M. malbarica* and *M. beddomie.*

Tuber crops—(*a*) *Sweet potato.*—The performance of exotic types V. 2. (Chinese) V. 6 and V. 8 (American) at Coimbatire and V. 14 at Mangalore was outstanding. Manurial trials with different levels of notrogen, potash and phosphoric acid showed that the treatment 'no basal manure plus application of 50 lb. nitrogen' alone per acre contributed to highest yield, whereas at Mangalore the highest yield was recorded with the treatment, green manure at 10,000 lb. per acre and application of nitrogen and phosphorous at 50 and 80 lb. per acre respectively. These results, however, remain to be confirmed. Dusting with five per cent Lindane proved to be an effective measure against the weevil pest.

(*b*) *Tapioca.*—The performance of Malavella, Neelam, Pattilavan Nachikoothan, Anaikomban, Kayalachadi, Butterstick,Ariyan and Sundarivellai was promising. Cuttings from terminal ends of the stems proved to be unsuitable for planting. In the manurial trials, basal dressing of farm-yard manure in conjunction with nitrogenous and potassic fertilisers tended to give increased yields.

Research has been in progress in tuber crops under a scheme partly financed by the Indian Council of Agricultural Research for the past four years. Items of work as varietal trials to isolate promising types, cultural trials for improving yields storage trials, manurial trials and studies on pest and diseases affecting tuber crops were intensely pursued. The results required, to be confirmed by further trials before recommending for adoption by cultivators.

Other economic crops.—The area under scented geranium was extended at the Pomological Station, Coonoor, so that its economics under cultivation on a commercial scale and extraction of oil could be worked out. Olive grafts from Italy, Tahitti lime from Ceylon, Tree onion from United States

America, the 'President' variety of potato, and seven types of arecanut from Andaman Islands formed some of the more important introductions at the Hill Fruit Stations.

Supply of plants.—The following statement furnishes the details of plants supplied and seeds made available to indentors in 1953–54 along with those of 1952–53 for a comparison :—

Serial number and centre.	Number of plants including vegetables seedlings supplied.		Quantity of seeds distributed.	
	1952–53.	1953–54.	1952–53.	1953–54.
			LB.	LB.
1 Pomological Station, Coonoor ..	13,512	18,699	39	36
2 Kallar and Burliar Fruit Stations.	17,325	13,095	211	837
3 College Orchards, Coimbatore ..	9,265	21,283	204	350
4 Fruit Centre, Wynaad	37,996	29,075	569	5,385
5 Fruit Centre, Taliparamba ..	6,968	23,532	..	..
6 Cashew Research Station, Mangalore	..	..	..	62
7 Model Orchard - *cum* - Nursery, Mangalore	1,017	2,645	..	168
8 Model Orchard - *cum* - Nursery, Periakulam	6,039	196	721	..
9 Model Orchard - *cum* - Nursery, Thimmapuram	1,933	890	440	42
10 Pepper Research Station	..	2,385	..	..
11 Ginger Scheme, Pattambi	..	..	..	..
12 Tuber Crop Scheme, Coimbatore ..	..	..	328	960
13 Tuber Crop Scheme, Mangalore ..	..	..	4,355	2,205
14 Government Botanical Gardens, Ooty	30,742	52,101	39	59
15 Sim's Park, Coonoor	71,124	66,261	7	7
Total ..	195,921	230,162	6,913	10,111

The supply of nursery plants from the several Agricultural Research Stations other than the fruit stations and centres which undertook the propagation and distribution of fruit plants is estimated at 11,700. It is estimated that by the above an area of 11,200 acres will be under improved types and orchard practices resulting in an additional production of 28,000 tons valued at Rs. 28 lakhs.

Schemes for establishment of model orchards-cum-nurseries in Madras State.—During the year planting of fruit trees was taken up and completed at the three centres, viz., Periyakulam (Madurai district), Mangalore (South Kanara district) and Thimmapuram (Salem district). The establishment of live hedge and wind break belts was put underway. Intensification of nursery activities, cultivation of intercrops on a well prepared cropping programme and provision of adequate irrigation facilities were all pursued on planned lines.

Fruit extension work on the Kodaikanals.—The scheme was in operation till 26th December 1953 when it was terminated as per G.O. Ms. No. 236, Agriculture, dated 1st December 1953. During this period the Fruit Assistant located over 27 sites as suitable for extension of fruit growing. One hundred and forty-nine (149) individual holdings were visited for advisory purposes, arrangements made for supply of over 2,685 plants to indentors from departmental nurseries and actually assisted in the planting of over 2,000 fruit plants. Besides the above, over 110 unthrifty trees were top-worked with superior scion material obtained from the Fruit Stations on the Nilgiris.

Bananas—Varietal collection.—The up-to-date number of banana varieties in the collection number 161 and eight varieties were added to the collection during the year. Morphological descriptions of 126 varieties were recorded. This number was reduced to fifty-five after grouping of synonyms. Twenty-nine dessert vareties and twenty-two cooking varieties have recorded bunch weights of 20 lb. or above. Data on suckering were collected for 87 cultivated banana varieties. Survey of banana growing areas was completed in the districts of Chingleput, Salem, North Malabar, Tirunelveli and South Arcot.

Economic gain.—Banana suckers of superior and heavy yielding varieties were sold to the public. Six thousand, one hundred and eighty-seven suckers from 87 banana varieties were sold during the year 1953–54. So far about 50 acres have been covered by banana suckers of improved varieties supplied from the Station.

Hybridization—(a) Actual progress made.—During the period 210 inflorescences of 75 cultivated varieties were crossed using four wild species of Musa as male parents. Of these 23 parental combinations have set seeds. Three hybrid progenies have been obtained and they are under study.

Mutants and selections.—Eight selections based on certain desirable economic characters were made and they are under progeny tests. The following field trials under progress were laid out after the damage to the standing crop of bananas during the cyclone of November 1942 :—

A. Propagation of Studies.—(1) Method of propagation, (2) Season of planting trial.

B. Plantation practices.—(1) Ratooning trial, (2) Mattocking trial.

C. Improvement of perennial crops.—(*a*) Desuckering trial, (*b*) Spacing trial, (*c*) Manurial trial and (*d*) Soil culture trial.

7. Systematic Botany.

Systematic Botany (Madras herbarium identification and incorporation).—During the period 876 specimens were identified of which about 406 specimens are for departmental and other officers as well as private correspondents. The total number of incorporations exceeded 600 in number and 200 specimens were lodged among duplicate specimen.

Surveys of district floras and compilation—(a) Ramanathapuram district.—During the period under report four taluks of the district, viz., Rajapalayam, Srivilliputtur, Sattur and Virudunagar were surveyed. The forest areas in Srivilliputtur and Rajapalayam afforded valuable collections, resulting in the collecting of 125 species most of them being new distributions for the district.

(*b*) *Flora of Tirunelveli district.*—Final typed matter for the survey was gone through and corrections incorporated. A final survey was conducted in Singampatti which afforded a few interesting specimens for taxonomical study besides a few new additions to the live plants of the Botanic garden.

(*c*) *Flora of Coimbatore district.*—No detailed surveys were conducted in this period the work being concentrated upon Ramanathapuram and Tirunelveli flora. Compilation from Herbarium material progressed satisfactorily and 26 families were covered comprising of 265 species.

The survey work was in progress from 1951 onwards. The surveys on completion will form valuable guides to the flora of the respective districts.

Economic Botany and Acclimatisation trials.—Work was in progress since 1946. Several species of grass, legumes and green manures obtained from

other States in India and from other countries were studied to determine their suitability to different tracts.

(i) *Fodder grasses.*—*Cenchrus* sp. (Blou Buffel) continued to perform well and showed quick regeneration habits. This is being introduced in differet pasture tracts. *Bothriochola insculpta* from *New Delhi* was promising and this species is being given extended trials in bigger plots. A few grasses were received from Delhi for trial during 1954–55 under plant introduction scheme. *Urochloa mosembiensis* and *Digitaria* sp. were planted in large areas with a view to meet the demands from private parties and departmental Research stations. Their soil binding capacities were much pronounced and both the species appear to be efficient soil binders.

(ii) *Fodder legumes and forage plants.*—*Desmodium tortuosum* a perennial did exceedingly well under dry conditions standing frequent cuttings. *Phaseolus semierectus* (P. Lathyroides) gave successful results and this species was multiplied. The seeds of this have been supplied to thirty-three Agricultural Research Stations for conducting trials *Stylosanthes Gracilis* was consistent in its performance and did well under field conditions as well as pots. *S. Sundaica* the other species tried was a failure during this season also, establishing its unsuitability to Coimbatore conditions.

Atriplex Vexicasia (*Salt Bush*).—The salt bush of Australia continued to perform well. Luxuriant growth and rapid spreading habits were among the desirable qualities of the species. The species is noted to resist salinity.

(iii) *Green manure plants and cover crops.*—Among several species *af Crotalaria C. browneii* and *C. grahaminna* gave satisfactory results. *Indigofera teysmanii* proved to be a quick growing one at Pattukkottai, Aduthurai, Nileshwar and Pattambi.

Glycine javanica maintained its spreading habits and drought resistant capacities. Among the species and strains of *Stozolobium* received from New Delhi under plant introduction scheme, *Mucana Summer* (E.C. 2533) *S. deeringianum* (E.C. 2534) *Mucana Cochinchinensis* (E.C. 1905) did well under dry conditions by producing plenty of foliage. *Stizolobium alterrimum* (Velvet Bean) was observed to cover extensive areas in a short duration.

Medicinal plants.—The collection of medicinal plants in the botanic garden was maintained.

Essential oil-yielding plants.—The analysis of the periodical harvests of the manurial trials of *Vettiver grase* at Pattambi and Wynaad was continued.

A very good collection of *Cymbopogon* species is being maintained. Besides this *Mentha spicata M. Piperata* and *Bursera delpechiana* and species of *Pogostemon* were included in the trials. *M. Piperata* was successfully grown under Coimbatore conditions. The area under this has been extended to examine the possibilities of its cultivation under field scale. Work was in progress since 1951. The best performers after further trials will be passed on to cultivators who desire to try essential oil-yielding plants.

Seed supply.—The following quantities of seeds of grasses, legumes, etc., were supplied during the period. Besides these, sample quantities of seeds of *grasses, legumes* and green manures were supplied to several research stations for trial purposes to determine their suitability in different tracts.

	LB.
Panicum antidotale	191¾
Cenchrus ciliaris	211¼
Cenchrus setigerus	28-5/16
Cenchrus ciliaris van echinoides	12

	LB.
Chlovus boyrnii	6
Iseilema laxum	5
Thin Napier	6
Centrosema pubescens	14¾
Pueraria phaseoloides	14-4
Indigofera endacaphylla	1–8

Studies on germination and viability of seeds.—In the third year of the above studies *Panicum antidotale* showed an improved germination of 63 per cent in this third year of storage, while *Cenchrus ciliaris* (*Blou buffel*) and *C. Setigerus* have shown a fall in germination after a period of two years. A germination of 22 per cent was observed in *Cenchrus sp.* (*Blou buffel*) up to 25th month and thereafter there was a gradual fall. Even the above percentage is to be considered fairly high for *Cenchrus sp.* With a view to enquire into the cause for this low germination in *Cenchrus sp.* spikelets collected in different seasons were dissected and grain setting was noted to range from 18 to 59 per cent. The germination of spikelets when tested in tact was negligible while the dissected grains showed high germination of 55 to 84 per cent. These studies will help to know the dormancy period and also the storage periods for obtaining maximum germination.

Studies on the longivity of weed seeds.—This is a new item of work taken up in the second half of the year under report with a view to study the viability of important weeds' seeds. To start with seven important weeds of Crop lands, viz., *Aristolachia bracteata, Abutilon indicum, Tribulus terrestris Digera arvensis, Acanthospermum hispidum* and *Flaveria australasiea* were included in the study. The first four species did not show any germination during the first two months. *A. hispidum* and *F. australasica* have given 7 to 14 per cent and 1 to 15 per cent germination respectively. The noxious gardenland weed, viz. *Trianthema portulacastrum* gave 27-48 per cent germination in the first month itself indicating that the seeds do not have any dormancy. The work will indicate when weeds could be tackled for controlling them. Further work is necessary.

8. Botanic Gardens and Parks.

Botanical Garden (Coimbatore)—Garden operations.—Propagation of various ornamental and avenue plants on a large scale to meet the requirements of the public as well as of the Agricultural Research Stations and other Government institutions was one of the few major items of work.

New introductions.—New types of ornamental shrubs orchards, grasses and economic trees were introduced.

Vanamahotsavam.—The Fourth National Tree Planting Week was celebrated and a large number of seedlings about 3,000—4,000 of all avenue trees have been raised for distribution to the public. In spite of it only 577 seedlings were distributed for cost and 812 by free transfers and book adjustments.

About 15,101 plants have been potted and kept for sale as well for grouping in various parts of the garden as against the total of 7,441 of last year.

Distribution of seeds, seedlings, etc.—The details of cash sales and free transfer are given below :—

Potted plants	4,372 Nos.
Avenue tree seedlings	1,389 ,,
Plant cuttings	356 ,,
Flower seedlings	138 ,,
Cut flowers	109 clumps.
Jasminum flowers	633 oz.
Woodapple fruits	448 Nos.
Sapota fruits	250 lb.
Avenue and other plant seeds	24 oz.
Flower seeds	243 oz.

A total receipt of Rs. 4,759–7–6 was obtained as against the receipt of Rs. 2,453–7–6 during the correspondin; period of last fasli year.

Government Botanic Gardens, Ootacamund.—Introduction of new kinds and varieties of ornamental and economic plants was undertaken as in previous years. During the period one new variety of *Gladioli*, viz., *Marguerite Fulton* a green house plant (*Peperomia sandersii*) and a cactus variety (*stapelia* sps.) were introduced and proved successful. Among economic plants seeds of 26 new species of Euaclpytus were received from Australia and these are under trial and their progress under Nilgiri conditions is under observation. During the period, floricultural records on the various annuals, trees and shrubs were collected which information was useful in the designing of various garden layouts and suggestion of suitable plant materials for various locations, etc.

Seed viability studies carried out on three important tree kinds, viz., *Eucalyptus globulus*, *Cupressus macrocarpa* and *Capressus torulosa* till 30 months from date of collection showed that *Eucalyptus globulus* kept up its viability without any deterioration, whereas the others cannot be stored for more than 12 to 15 months, without deterioration in their viability.

Sim's Park, Coonoor.—Floricultural study on the various annuals, shrubs and trees in the park gave useful information on their vegetative and floral characteristics which is quite useful in the designing of mixed borders and shrubberies in garden layout according to location and plant materials available.

Studies on the taxonomy of the various roses and Eucalyptus species were carried out during the period to evolve a key for identification. Descriptions were completed for 62 varieties of roses and 30 species of Eucalyputs.

Seed viability studies were carried out during the period of three improtant tree kinds, viz., *Eucalyptus ficifolia*, *Eucalyptus citriodora* and *Jacaranda mimosaefolia* which showed that maximum germination are obtained from fresh seeds only and as they get older by storage the viability declines.

Among the successful new introductions during the period were the various clover varieties, viz., subterranean white clover, lupins, perennial rye grass, cuttings of pepper vine for trial and out of the 25 cuttings of rooted pepper vines planted only three are surviving.

9. Plant Physiology.

Research—Pre-soaking studies.—Studies were continued in a scheme partly financed by the Indian Council of Agricultural Research to investigate the possibilities of pre-soaking seeds in nutrient salt solutions as a method of increasing the crop yields. It was found in the case of ragi that pre-soaking

the seeds in phosphate solution of suitable type and concentrations could compensate to a large extent, the disadvantage when plants were grown in a phosphate-deficient medium.

Very marked increases in growth and yield were obtained in paddy and cotton in pot cultures as an effect of presoaking the seeds. Tribasic potassium phosphate was the best for paddy and ammonium phosphate was the best suited salt for cotton. In field trials the increase in yield in paddy was similar but of a lower order than in the case of cotton. Further trials are, however, necessary since the season was not a favourable one for cotton this year. Work was in progress since 1952 and further trials are necessary for confirmatory results.

Trace elements.—The application of phosphate and other nutrients including trace elements like copper zinc, and manganese was tried on different crop plants, like paddy, cotton and ragi to see how far the growth and yields could be improved thereby. Field experiments and pot culture trials were carried out at Coimbatore and at the Agricultural Research Station, Aduthurai, to see the comparative effects of applying trace element salts to paddy as sprays and soil dressings. No definite conclusions are possible from the results obtained so far. The studies are being continued for a second season.

The effect of zinc supplied in the form of spray treatments and to the soil is being studied both in pots and in the field to see how far the yields could be increased as claimed by workers in Mysore.

Chemical and analytical.—Methods for the determination of manganese and zinc were tested out and the most suitable methods standardized. Work is in progress since 1954.

Weed control by Chemical Herbicides.—Studies were carried out under a scheme financed partly by the Indian Council of Agricultural Research to devise suitable methods of eradicating or controlling some of the most troublesome and persistent weeds in South India. The main weeds studied were *Cyperus rotundus*, *Cynodon dactylon*, *Trianthema portulacastrum and Acanthospermum hispidum* at Coimbatore, Paramakudi and Sathyamangalam and spurre and oxalis were tried in different dosages including various formulations of 2 : 4-D, M.C.P.A., 2, 4, 5-T, I.P.P.C., and P.C.P., diesel oil and nutmeg leaf oil both single and in combination.

It was observed that in the case of dicotyledonous weeds a complete and permanent eradication was secured by a single spray of hormone chemicals at dosages of 2 to 4 lb. per acre. In the case of *Aristolochia* regrowths appeared about a month after spraying from the underground portions and a second spray was needed to kill these. In the case of grassy weeds too, the aerial portions could be killed off by most of the chemicals tried, the best being a combination of 2 : 4-D and M.C.P.A. as the sodium salts and diesel oil, but on account of the underground stolons, regeneration occurred in varying degrees after an interval. Regeneration was prevented for ten weeks after spraying the above combination of Na. 2 : 4-D and M.C.P.A. and diesel oil. Work was in progress since 1952 ; other chemicals are also being tried and the work is being continued.

Studies on seed viability and germination.—Studies were continued to test in more detail the utility of 2, 3-5 triphenyl tetrazolium chloride in assessing seed viability. It was found that dehusking was necessary for a correct assessment of viability by these chemicals in dormant paddy varieties. Results have been passed on to the seed development staff for adoption.

Methods of overcoming dormancy in seeds (especially paddy varieties) were tested. It was found that for paddy, keeping the seeds at a temperature of 35°C was helpful in breaking dormancy. Work was started in 1953 and has to be continued.

10. Cyto-genetics.

The research work in this section helps the plant breeders in their work of evolution of superior strains. The results of research are reported below :—

A. Actual progress made during the year under each problem.—In paddy further tetraploid progenies were raised and studied for their fertility and other segregating characters.

The progeny of the allotetraploid cumbu was studied. A comparative study of nine allotetraploids was done.

A bulk population of two hundred plants in autotetraploid cumbu was raised.

Sixteen F. 2 plants were grown from seeds obtained from the semi-sterile interspecific hybrid between *S. halepense* and Co. 1 grain sorghum. Crossed seeds of *S. sudanense* with *S. Roxburghii* and *S. Subglabrescents* were sown.

Fifteen varieties of cultivated set from Japan were received.

The determination of chromosome number in the interspecific hybrid between Monthan and M. Coccinea was taken up. Investigation of the species of *Vitaceæ* was continued.

B. Results of research obtained during the period.—Twenty selections from the paddy tetraploid progency have been taken. Hybrids were not noted in the progeny of the crossed seed (interspecific crosses).

Nine allotetraploids were studied in Pennisetum for chromosome pairing and behaviour during meiosis. Three kinds of allotetraploids have revealed two types of chromosome pairing. The progeny of the allotetraploid are all 42 chromosomed plants.

Sixteen fertile F. 2 Plants with 2n = 40 chromosomes of the interspecific hybrid of *S. halepense* × Co. 1 sorghum were raised. The F. 2 plants were intermediate in morphological characters. One 20 chromosomed F-2 resembling the cultivated sorghum was isolated.

Fertile hybrids between S. sudanense and grain sorghum were raised.

Of the fifteen varieties of cultivated setarias from Japan five were found to be resistant to rust.

The chromosome numbers of Monthan and *Musa coccinea* were determined to be 2n = 33 and 24 respectively.

Economic work.—The items of research are in experimental stage. In the hybrids fertility has to be built up. The progenies are analysed cytologically and particular plants are chosen for back crossing. Setts or slips of the hybrid of Cumbu Nasur were supplied to the following for trial as fodder :—

District Agricultural Officer, North Malabar	1,000
District Agricultural Officer, South Arcot	1,000
District Agricultural Officer, Coimbatore	1,000
District Agricultural Officer, North Arcot	1,500
District Agricultural Officer, Nilgiris	100
Superintendent, Agricultural Research Station, Satyamangalam	500
Sewage Farm, Madura Municipality	100
Total ..	5,200

11. Agronomy.

The Agronomist and Professor of Agriculture has laid out the following Agronomic experiments during the year :—

(1) *Combined effect of tillage, manures, and irrigation on garden land crops.*—The experiment was designed to study the effect of *tillage* manures and irrigation on crops in garden lands.

(2) *Combined effect of tillage manures and irrigation on paddy crop in wet lands.*—The experiment was designed to study the effect of tillage manures and irrigation on paddy in wet lands.

(3) *Rotation experiments.*—To study the effect of two types of rotations on crop production and economics.

The experiments were laid out during the year and the results are not yet available.

12. Agricultural Engineering (Research).

1. (*a*) *Designing of animal-drawn and manually operated machinery for the cultivation and harvesting of groundnuts.*—The following implements designed and manufactured were put through a series of preliminary trials and gave satisfactory results. These implements are now undergoing field trials at the Agricultural Research Station, Tindivanam.

(1) A manually operated seed box attachment for the country Gorru.

(2) A-3 tyned bullock-drawn seed drill for sowing groundnuts.

(3) A bullock-drawn 5-foot rake for collecting the vines from the field after being harvested with a Guntaka.

(*b*) *Designing of tractor-drawn machinery for the cultivation and harvesting of groundnuts.*—A tractor-drawn Guntaka for harvesting groundnut was designed and manufactured. This implement was field-tested both at Pollachi and at Tindivanam and the results were satisfactory. A tractor-drawn seed drill for sowing groundnut that was designed is now undergoing field trials. The results of the preliminary trials have been very encouraging.

2. (*a*) *Studies on tube wells.*—An open ended tube well strainer which could be lowered into the ground in the same way as the casing pipe with the aid of a soil auger and sand baler was designed and manufactured. During preliminary tests carried out at Perur, it was found that this strainer could be installed at a depth of 28 feet in half the time required for installing a standard type by the method now in vogue. No infilteration of sand into the tube well nor any damage to the strainer was noticeable. A larger number of trials under varied conditions will be made before this method is advocated for general adoption.

Studies on bore-wells and well-boring equipments.—A design for a small percussion type well boring *rig* has been worked out and the first rototype is now under manufacture.

(*b*) *Trials with overhead irrigation.*—Preliminary trials were conducted with Kennel's Oscillator spray irrigator. A manually operated spray line has also been designed and manufactured. The receipt of a few other types of spraying mechanisms and of a suitable pump is awaited for conducting comparative trials.

3. *Devising manually operated and animal-drawn machinery for pumping.*—A bullock-operated pump employing two plunger type pump units worked by a pair of bullocks walking round in a circle and capable of being used both in open wells and in tube wells was designed and manufactured. The open well model was tested at the central farm and the output of 2,700 gallons per hour

with a maximum draught of 190 lb. was obtained. The tube well model was tested at the Agricultural Research Station, Aduthurai, and an output of 2,400 gallons per hour with a maximum draught of 150 lb. was obtained. The design of the driving gear is being modified with a view to increasing the efficiency of the pump and obtaining an output in the neighbourhood of 4,000 gallons per hour.

4. *Devising implements on the Japanese model for paddy cultivation.*—A few imported Japanese implements have been tested and minor modifications that were found necessary to make them suit local practice and soil conditions have been made.

A fertilizer distributor attachment to the Japanese rotary weeder was designed and manufactured. Preliminary tests with this attachment gave encouraging results. Twenty rotary weeders fitted with the above attachment have been manufactured and distributed to different Agricultural Research Stations for field test.

A power operated paddy thresher on the model of the Japanese machine is under manufacture. This machine is designed to thresh winnow and bag the grains all in one operation.

5. *Devising an insecticide spraying and dusting equipment capable of being manufactured by local firms.*—Two different types of low volume spray nozzles were designed and manufactured. Preliminary trials were conducted with these both by the Government Mycologist, Coimbatore, and the Plant Protection Officer (Mycology), Coimbatore. The results reported indicate that the performance of one of these is comparable to that of an imported low volume spray nozzles now in use.

A large number of these nozzles will be manufactured and distributed to the Agricultural Research Stations for field tests.

6. *Devising a suitable drying chamber for the processing of arecanuts.*—A drying chamber of a new design for drying arecanuts was tried at Kumaranallur. Several modifications to the design were made to eliminate the defects noticed during the preliminary trials. The last tests that ware conducted indicated that the drying is done uniformly and rapidly and that the total fuel consumed for the processing of arecanuts is used for the subsequent drying of the nuts. Further trials are in progress for determining the optimum dimensions for the drying platform.

Miscellaneous—F.E.C. Thresher.—An F.E.C. thresher manufactured by the farm Equipment Co., Coimbatore, was received for trials. The unit was tested in the holdings of Sri G. Purushothama Naidu at Puliyakulam. It was found that the machine gave an output of 12 bags per hour in the case of cumbu 6 bags, in the case of cholam, and that the threshing was complete and the winnowing satisfactory in both cases. The machine had to be run at a reduced speed of 800 r.p.m. in the case of cholam to avoid the threshed grains being damaged whereas it could be run at a higher speed of 1,400 r.p.m. in the case of cumbu. The machine is of all metal construction, sturdy, east to operate and priced at Rs. 1,875.

Sugala Plough.—An animal drawn mould board plough called the 'Sugala' plough was received from Messrs. Gillanders Arbuthnot & Co., for trials. The plough was tested at the Central Farm, Coimbatore. It was found that under local conditions it could plough a furrow 3 inches wide and 5 inches deep. It turns the soil well and recorded draft of 110 lb. is low enough to enable small size animals to be used. It was recommended that the plough is to be completely modified to enable a shaft pole of a thicker section to be used as the shaft pole provided was found to be weak at the point where it is bolted on to the plough.

13. Agro-Industries.

1. *Bee-keeping.*—The Plant Protection staff also rendered assistance in bee-keeping though no special scheme for the purpose was functioning in the residuary State. Two maistries were specially sanctioned for this work in Madras City area. Fifty-nine colonies were newly hived. About 3,015 colonies were kept functioning in all the districts and 14,000 lb. of honey were estimated to have been obtained from them.

2. *Malt-manufacture.*—The factory was closed on 31st January 1953 and the plant and machinery are under disposal.

3. *Ergot production.*—The production of ergot was continued during the year. On the ergot farm, Ootacamund 21·5 acres were sown to rye during the early season, and 14·0 acres during the late season. On the Agricultural Research Station, Nanjanad and ryots lands another 60 acres were sown to rye during the year. A total quantity of 582 lb. 8 oz. of ergot was obtained. On the ergot farm the yield of rye grain was 6,577 lb. The 'petkus' variety obtained through the Food and Agricultural Organization was not very well adapted for ergot production. The variety 4n Rosen obtained from Germany failed to germinate. 'Canadian old spring' exhibited better growth and was susceptible to ergot. The crop was infected by *Helminthosporium sativum* which affected ergot production to some extent on the ergot farm. Micro-analysis of the sclerotia was carried out and the fungus brought into culture from those having 0·53 per cent of alkaloids.

During 1954–55 season the production of ergot was confined to the ergot farm as private growers did not come forward to take up this work on the reduction of the purchase price of ergot to Rs. 9 per lb. An area of 24 acres has been sown to rye on the farm.

Fruit preservation work.—A fruit preservation unit was established at Ambalavayal (Wynaad colony) 1953 and work was commenced immediately. A total quantity of 22,954 ounces of squash and 586½ lb. of jam valued at Rs. 2,076–5–0 was manufactured and disposed of during the year. The products were popular and the work is being continued on a larger scale.

14. Agricultural Research Stations.

The Agricultural Research Station, Aduthurai.

I. Results achieved in research during 1953–54.

Paddy—(1) *Seed multiplication.*—The total quantity of paddy produced during the period under report was 170,347½ lb. and the quantity of nucleus seed of the different strains distributed was 85,707 lb.

(2) *Breeding*—(*a*) *Introduction.*—Trials were conducted for raising a third crop of paddy after the harvest of the Thaladi crop with the help of lift irrigation. Some of the short duration varieties, namely ADT. 3, ADT. 9, ADT. 14, ADT. 14, ADT. 18, ADT. 19, ADT. 20. ADT. 23, Co. 12, Co. 20, S.W. 1251, PLR. 2 and Blast resistant culture 6,522 were grown at the station to fix up the suitable varieties for the season. In addition, nine early Chinese varieties were grown under observation plots and it was observed that these types did not come up well during the season though they were found to come up well

in the Kuruvai season. The performance of other strains were equally disappointing since setting of grains was not proper resulting in low yields. From this year's experience, it can be said that growing a third crop of paddy is not feasible.

(*b*) *Pure-Line selection.*—Three cultures in each of Kattaivellai, Kodaivellai and Kaivarisamba the three important rainfed varieties of Arantangi taluk, were under final yield tests on the station and in the district. Eleven cultures in Kattuvana, a flood resistant variety of long duration were under replicated yield trial and all the cultures were carried forward for further trial, since the results of the years trial were vitiated due to insect damages.

(*c*) *Hybridization.*—Progenies of crosses in different generations intended for the evolution of blast resistant strains of short, medium and long durations, were studied for their resistance to blast disease. A total of 111 progenies were under study during the Thaladi season and selections were taken for further study.

(3) *Manurial experiments.*—As in the case of Kuruvai season, the results from the three manurial experiments namely (i) organic matter requirement of the spil, (ii) nutrient requirements of paddy and (iii) permanent manurial experiment, in the Thaladi season also, were vitiated due to severe incidence of stem borer and no conclusions could be drawn.

Cultural experiments—Japanese versus *Farm method of cultivation.*—This experiment was repeated in Samba and Thaladi seasons. But the incidence of stem borer was so severe that no useful results could be obtained except for the observations recorded in the early stages of crop growth. The growth and tillering in the Japanese method plots were better than those in the Farm method ones.

(4) *Other crops*—(i) *Cotton in rice fallows.*—After the harvest of paddy in February–March 1954 an area of 6·75 acres was sown with cotton P216 F. bulk and an area of 4·79 acres was utilised for experiments in cotton during the year. A total quantity of 2,096 lb. of kapas was gathered during the period under report from the bulk crop. The yield from the early sown crop in the Samba area worked out to 660 lb. of kapas per acre.

(ii) Groundnut TMV 2 was sown in an area of 0·89 acre in rice fallows during the year. It was found that the development of pods was very poor owing to the unsuitable soil conditions and the crop was a complete failure.

(iii) Irrigated Gingelly TMV 2, was grown in the rice fallows to an extent of 0·44 acre. Due to severe damage caused by caterpiller pest (*Prodenia*) a poor yield of 270 lb. of pods per acre was obtained.

(iv) *Ragi.*—An area of 1·19 acre was planted with ragi varieties AKP 1, Co. 2 and cultures E.C. 4061, E.C. 4310 and E.C. 4573 in wet land after the harvest of paddy. The growth and stand of the crop were poor in the case of all varieties and the cultivation of this crop in rice fallows proved to be uneconomic.

(v) *Fruits and vegetables.*—A total area of 1·78 acre was grown with bitter gourd, snake gourd, bendai, tomato and other vegetables for the production of seeds and seedlings. In addition a fairly large number of fruit plants comprising mango grafts, seedlings of acid lime, rooted cuttings of Malta lemon and jack seedlings were produced for distribution. The quantity of seeds and number of seedlings and fruit plants distributed during the period under report are given below :—

Vegetable seeds ..	71 lb. 2½ oz.
Vegetable seedlings.	108,664 Nos.
Fruit plants ..	2,792 Nos.

(vi) *Green manure crops.*—The following table gives the quantity of green manure produced and utilized for manuring and the quantity of seeds, cuttings and seedlings distributed during the period under report :—

——	Quantity of green matter produced.	Quantity of seed supplied.	Number of seedlings supplied.
(1)	(2)	(3)	(4)
	LB.	LB.	NOS.
Sesbania	73,150	100	..
Gliricidia	134,802	13	14,550

(vii) *Fodder crops.*—The quantity of green grass cut and fed to milch cows and the number of slips in Napier, Guinea, and Buffalo grasses sold are furnished below :—

Green grass cut and fed to cattle ..	45846 lb.
Slips of Napier grass sold	Nil.
Slips of ginuea grass sold	250 Nos.
Slips of buffalo grass sold	1,700 Nos.

(5) *New sources of lift irrigation.*—One filter point tube well in 'K' block was sunk during the period. These serve remarkably well as additional sources of irrigation during summer months for raising vegetables in garden land, cotton and other crops in rice fallows as well as for raising Kuruvai nursery in advance of the receipt of canal water.

II. Programme of work for 1954–55.

Paddy.—All important strains will be multiplied for seed production. Evolution of strains by selection and hybridization and introduction of strains and varieties will be continued.

Manurial and cultural experiments of the previous year will be continued.

Plant protection.—Insecticidal method in collaboration with the Government Entomologist for control of 'Stem borer' and 'Soorai' of paddy and disease bombardment test of blast resistant cultures in collaboration with the Government Mycologist will be continued.

Crop weather scheme.—Observation on crop weather will be continued.

Cultivation of cotton in rice fallows, raising green manures, production of vegetables, propagation of ruit plants and maintenance of poultry will be continued.

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

I. Results achieved in research during 1953–54.

Banana varietal collection.—The up-to-date number of banana varieties in the collection is 161. The varieties namely Nanguneri Peyan (two types) (i) rind ashy coated and (ii) rind coloured green Erachi Vazhai, Erode Nadan, Erode Monthan, Banares, Hadagalli, Kallar Laden, Kallar Anaikomban, Uthiran Vazhai, and Ela Arisi were added to the collection during the period under report. The banana varieties which have performed well at the station and which have given bunch weights of 20 lb. and more under both perennia and wet land conditions are listed below.

Desert varieties.—Vamanakeli, Jahaji, Walha, Kullan, Poovan, Nattu poovan, Cheni Champa, Rasthali, Suganthi, Gros michel, Wathere, Kodapanialla Kunnan, Poovilla Shundan, Kapur, Manna, Ladies Finger, Nendra.

Padathi, Cheena Bale, Kali, Raja Vazhai, Boothi Bale, Peyan, Vella Kadali, Krishna Vazhai, Sirumalai, Virupakshi, Venneetin kunnan and Octoman.

Culinary varieties.—Monthan, Ponthan, Malai Monthan, Kallu Monthan, Sambarani Monthan, Pidi Monthan, Bontha Kuri Bontha, Nalla Bontha, Pacha Bontha Batheesa, Booditha Bontha Batheesa, Adukkau Monthan, Ash Monthan, Kanch Kela, Bainsa, Maduranga Bale, Nalla Bontha Batheesa Thella Bontha Supari, Lambi Kachkol and Soneli.

Hybridization.—During the period under report 210 inflorescences of 75 cultivated banana varieties were crossed. Of the crosses effected 23 parental combinations have set seed.

Mutants and selections.—The progeny tests of the plants of Monthan and Rasthali selected for high grade of fruits have indicated that clonal progenies have not shown the parental characters.

Propagation and plantation practices—A. Propagation studies—(1) *Method of propagation.*—This trial to find out if whole rhizomes and bits of rhizomes can provide quantitatively more conveniently available material for raising new plantations was initiated on 22nd June 1954.

Season of planting trial.—This observational trial to assess the relative merits of the various months of the year for planting purposes is in progress from March 1953 onwards. Monthly planting of 25 suckers in each of Monthan and Poovan varieties was completed in June 1954.

B. Plantation practices.—Ratooning and Mattocking trials are in progress.

Improvement of perennial crops.—(*a*) *Desuckering trial.*—This trial to devise the optimum desuckering practice in perennial banana plantations was relaid during January 1953 and the trial is in progress.

(*b*) *Spacing trial.*—This observational trial to determine the optimum spacing in perennial banana plantations was continued in the same area retaining the best sucker in the clump after removal of the plants broken by cyclone during November 1952. One harvest of all the plants under this trial was completed by 15th June 1954. The treatment 12 feet × 12 feet spacing is leading the rest namely 9 feet × 9 feet, 10 feet × 10 feet and 11 feet × 11 feet spacing in respect of mean bunch weight of 182 lb. per bunch while in total yield from plots of equal area the highest yield was obtained from the closest spacing of 9 feet × 9 feet and the total yield has gradually decreased with the increase in spacings. This observational trial is being continued in the same perennial area with followers from the same clumps with a view to study the progressive data for a number of years in respect of mean yield from unit area.

(*c*) *Manurial trial in the perennial area.*—This trial to find out the value of different manurial practices in perennial banana areas by the application of cattle manure, ammonium sulphate and groundnut cake either alone or as a mixture of any two and to ascertain how far the addition of potash and phosphoric acid would contribute to yield was relaid adopting a 2 × 6 confounded factorial design on 13th January 1953. Time of application of fertilisers was also taken as an additional factor for study. The application of first and second doses of manures as per the schedule of treatment combinations was done during August and December 1953, respectively. So far, out of a total of 576 experimental plants only 329 plants have flowered and of which 202 plants have come for harvest. The trial is in progress.

(*d*) *Soil culture trial.*—This trial to determine the frequency of soil digging in perennial banana plantation was relaid during January 1953 with four treatments namely digging once a month, once in two months, once in three

months, and once in four months. So far only 61 plants have come for ha out of 384 experimental plants. Digging once in two months with a bunch weight of 23·5 lb. is leading the rest at present although it is too to draw any conclusion.

II. Programme of work for the year 1954–55.

I. *Varietal collection.*—Checking and completion of the morpholc descriptions of the banana varieties already recorded will be undertaken. far morphological descriptions of 126 banana varieties including syno have been recorded. Survey tours to cover representative banana tracts o state will be made for systematic studies of varieties, spotting out of mu and collection of unrepresented varieties and species.

II. *Hybridization.*—The work of crossing the cultivated varieties of ban with the wild species will be continued with a view to build up disease resi dwarf and more desirable types of commercial banana varieties. In addi the seed set and germination capacity of seeds got by hybridization of al important varieties will also be studied. Further detailed study on hybrid progenies already obtained will be made.

III. *Mutants and selections.*—Progeny tests of eight selections made d the last year will be continued. The selection of possible mutants in ou plantations and in the station and conducting of clonal progeny tests be undertaken.

IV. *Propagation and plantation practices.—A. Propagation studies. Method of propagation.*—This trial to find out if whole rhizomes and bi rhizomes can provide quantitatively more conveniently available mat for planting purposes, is in progress from 22nd June 1954 and will be contir

(2) *Season of planting trial.*—The observational trial of assess relative merits of the various months of the year for planting purposes progress from March 1953 onwards. Monthly planting of 25 suckers in ea Monthan and Poovan varieties was completed up to June 1954 and the tr being continued.

(3) *Performance study of banana suckers produced during different s of growth of parent plants.*—The trial to ascertain the best stage at which ba suckers should be allowed to be produced on the parent plants for propaga is proposed to be initiated during August 1954. The lay-out plan for this was submitted to the Statistician Indian Council of Agricultural Research got approved.

B. Plantation practices.—Ratooning, mattocking rotational and tim application of fertilisers *cum* spacing trials will be continued.

(4) *Time of application of fertilisers* cum *spacing trial.*—This tria arrive at the best periods of application of fertilizers for bananas and to de mine the optimum spacing under wet land system of cultivation is prop to be initiated during December 1954—January 1955.

V. *Improvement of perennial crops.*—Desuckering, manuring and soil ture trials will be continued.

The Rice Research Station, Ambasamudram (Tirunelveli district).

I. Results achieved in research during 1953–54.

Seed multiplication.—In both the Kar and the Pishanam seasons (first second crop) a total area of 20·02 acres was put under improved strains of pa for seed multiplication and distribution to ' Primary Seed Farms' and the t quantity of seeds thus produced was 49,485 lb.

Paddy.—Single plants selections of the local varieties, viz., Maikuravai, Seenganni, Banku, pulithi, pirati, Sembuli and Varigarudan Samba were under study.

Kar crop (first crop season)—Single plants selections of Maikurivai, Seenganni and Banku.—Twenty promising cultures in each of Maikuruvai and Seenganni and 50 in Banku were carried over for further work.

Comparative yield trial of ASD 1. *X. Veedhividangan.*—Of the 14 progeies under trial eight were found to hold out promise with regard to their yield performance as well as their non-shattering habit for which the crosses were effected.

Summer ploughing experiments.—The trial on summer ploughing did not prove its superiority over the ordinary puddling method and the experiment was therefore concluded.

Pishanam (second crop season).—Single plants selection work in Pulithi, piratti, Sembuli and Varigarudan samba was in progress in different stages.

Japanese versus *Farm method.*—The findings in the Pishanam season also corroborated the earlier observations made in the Kar Season, viz., the increase in yield obtained in the Japanese method of rice cultivation was not commensurate with the expenditure incurred for its method of cultivation.

Miscellaneous—Trial of groundnut in rice fallows during the summer months.—In spite of the poor yield of 370 lb. recorded due to a variety of reasons, viz., excessive rains (9 inches) immediately after sowing which interfered with proper germination, absence of adequate showers thereafter in the growing period, lack of supplementary irrigation facilities on the station to tide over the contingency and germination of mature pods due to seepage water from around the fields at the time of harvest, the indications of the trial are that raising a crop of groundnut after the Pishanam paddy in the rice fallows is possible provided additional irrigation facilities could be provided during summer.

Green manure.—Sesbania and Daincha were grown for green manure over 4·00 and 0·51 acres respectively. Both the crops had a severe set back in growth due to inadequate and ill-distributed summer showers. With two wettings after the receipt of water in June they pulled up and have so recorded average yields of 12,000 and 8,000 lb. of green matter respectively per acre.

The vast potentiality of augmenting the production of green manure by raising a marginal crop of sesbania in the first crop to solve the manurial problem of the second crop (Pishanam) was amply demonstrated on the station. An additional quantity of 43,694 lb. of green manure was thus obtained, besides 480 lb. of seed were collected from plants left at 4 feet intervals for seed production.

	LB.
Seed distribution—	
Paddy seeds	49,485
Green manure seed—	
Glyricidia seeds	5
Crotalaria seeds	67
Vegetable seeds—	
Cowpea (New era) seed	13
Sword been seed	1
Bendai seed	1½
Gogu seed	2½

	LB.
Miscellaneous—	
Prosopis seed	17
Water grass slips (Nos.)	3,400
Guinea grass slips (Nos.)	9,300
Glyricidia cuttings (Nos.)	4,000
Ipomea cuttings (Nos.)	200
Jack seedlings	50

II. Programme of work for 1954–55.

Paddy.—Work on evolution of strains in local varieties will be continued.

Manurial and cultural trials and Japanese method of paddy cultivation will be continued.

Growing of green manure crops and vegetables will be continued.

Regional Millet Station, Ariyalur (Tiruchirappalli district).

I. Results achieved in 1953–54.

Ariyalur.—In yield trials, two selections in each of Vellaimakkattai, Manjamakkattai and Kaka Irungu were superior to their respective standards. Two sections of Talaivirichan Cholam were superior to Co. 2 in preliminary yield trials. From collections under study 21 selections were taken for preliminary yield trials. Four selections of Palladam Cumbu were superior to the local bulk. In varagu, five selections were significantly superior to the local bulk in yield trials. The total quantity of seed distributed from the station was 315 lb.

II. Programme of work for 1954–55.

Ariyalur.—Evolution of high yielding strains of the local varieties of cholam, late seasons Palladam Cumbu, Ragi and Varagu.

The Central Farm, Coimbatore.

I. Results achieved in 1953–54.

(*a*) *Central Farm.*—An area of 26·47 acres of cultivated land situated on the eastern side of the College Estate abutting the Robertson road was acquired during the year raising the total area of the Central Farm to 220·38 acres.

The Central Farm offered all land and labour facilities to the Crop Specialists and other officers for conducting their experiments. The experiment on placement of fertilizer in paddy approved in the three-year programme for 1950–53 was conducted on the wet lands during the main crop season. Although the straw yield improved by the application of ammonium sulphate, the method of application had no significant effect on it. The use of superphosphate did not affect either the grain or the straw yield.

An area of 36·65 acres of paddy during the second main season and another 10.49 acres during the second crop season were grown. An average acre yield of 2,182 lb. grain for the main crop and 1,800 lb. for the summer short crop were recorded. The Japanese method of cultivation of paddy was demonstrated in J. block where GEB 24 paddy was raised. The crop was affected by blast and premature lodging. Hence the yield from the Japanese method was not appreciably higher than the ordinary method.

Sesbania speciosa was sown in wet lands on an area of 20 acres. The green leaf got therefrom was sufficient to manure an area of 36.65 acres of paddy. In

addition, *Glyricidia* was planted on all wet land bunds and *Sesbania* seedlings all along the bunds both for green manure and for seed production. *Indigofera teysmanii* was also planted in the wet lands.

The cotton crop on rice fallow was affected by pest in the early stages and timely application of pesticides prevented the crop failure. MU. 1. cotton grown on garden lands over a total area of 32·45 acres had the benefit of rains received during the period of growth but the rains were so continuous that it was not possible to give timely weeding. Hence the seed-cotton acre-yield was only 685 lb. per acre.

An area of 7·44 acres was grown under irrigated fodder crops using the sullage water of the Estate. During the year one acre of Guinea grass in western block was removed as the land had become sick and a fresh area of 1·40 acres was again brought under it in the same block. It recorded an acre yield of 70,000 lb. of green grass which was cut systematically and fed to the dairy herd and the work animals. Maize grown on an area of 4·40 acres gave an acre yield of 13,303 lb. and maintained a continuous supply of green fodder to the milch cows during the period.

A large number of seedlings was distributed to ryots and institutions or planted in all available space on the College Estate. Nurseries of economic and leaf yielding trees were raised throughout the year. The Central Farm is now in a position to meet the needs of farmers in respect of all important seedlings of economic value.

On account of increased facilities provided for irrigation and larger cropped area both on wet lands and garden lands, the revenue of the Central Farm was raised to the sum expended on cultivation.

(*b*) *College Dairy.*—The strength of the cattle at the commencement of the year was 48. Thirteen calves were born. One Murrah buffalo calf died due to gastro enteritis. One Murrah buffalo stud bull and two Schindi stud bulls were transferred to Central Farm. Four Schindhi bull calves were transferred to Livestock Research Station, Hosur and one Schindi stud bull to District Veterinary Officer, Coimbatore. The closing balance at the end of the year was 52.

Dairy worked at a profit of Rs. 2,479.

The number of goats which was four in the beginning of the year was raised to nine at the end due to further additions through birth of goatlings.

The poultry section which possessed a total of 153 birds to start with had 235 birds added by hatching and 14 others by transfer from Hosur. Out of these 187 birds were sold, 25 birds were transferred to Project Executive Officer, Palghat and 40 birds died. The closing balance was 150 birds.

II. Programme of work for 1953–54.

The College Farm and dairy will continue to afford all facilities for practical training to the students of the Agriculture College. The crop Specialists and other Research Officers will continue to receive facilities for conducting field experiments.

All strains of crops which are in demand will be multiplied for seed production to the maximum extent possible.

The Pomological Station, Coonoor (The Nilgiris).

I. Results achieved in research during 1953–54.

Two mixed American apple varieties introduced from the United State of America and two Cherimoyer selections emerged out as promising during the year. Among the rootstocks under trial for apple, Merton 779 and M. 778 in respect of tree vigour and crab in respect of yield were the most promising. Spraying trials with Sandolin ' A ' for the third season in succession confirmed its superiority in hastening blossoming and promoting fruit yields in apples over linseed oil emulsion. A progressive accentuation of incompatibility between scions of plum varieties, Czar and Gaviota on plum seedling rootstock has been evidenced. In the trial with rootstock of varying ages on two peach varieties, observations go to show that the scions on eight month old stocks were vigorous and yielding more than on the other two stocks.

New introductions during the year include olive grafts from Italy, tree onion from United State of America, five lemon varieties, one pomegranate from Yercaud noted for its superior quality, Linaloe, an oil-yielding plant and nearly a dozen green manure and cover crops.

II. Programme of work for 1954–55.

Further work to extend the trials on hand 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, top working choice but shy bearing plum varieties, isolation of high yielding strains and individual trees of merit, and through the use of hardy and diseases resistant rootstocks will all be continued on approved lines.

The Kallar and Burliar Fruit Station (The Nilgiris).

I. Research achieved in research during 1953–54.

In the rootsock trial for the mandarin orange at Kallar the growth of plants on sweet lime and pummelo was the poorest. The large number of casualties on sweet lime stock has indicated its relative unsuitaiblity for the mandarin scion. In the root stock trial with jack and annonas, Rudrakshi for the former and bull's heart for the latter emerged as promising in respect of tree vigour and growth.

Planned hybridization work in citrus, annonas and bananas resulted in the production of hybrid progenies which were under study. Hybridization between pine-apple varieties did not lead to any success.

II. Annual programme of work for 1954–55.

Improvement 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. The progeney trials with mangosteen mandarian orange and jack, rootstock trials with mandarin orange, jack, annonas, clove and nutmeg will be pursued. Hybridization work to evolve new and promising types of citrus, pine-apple, bananas, 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.

The Sugarcane Research Station, Gudiyattam (North Arcot district).

I. Result achieved in research during 1953–54.

A. Sugarcane—Varietal study plots.—Fifty-nine varieties are under study. Arrowing this year was more both in respect of the varieties that arrowed and also the percentage of arrowing compared to last year.

Six varieties namely Co. 732, Co. 851, Co. 853, Co. 873, Co. 913 and I.C. 222 and six varieties namely, Co. 810, Co. 750, Co. 761, Co. 785, Co. 782 and I.C. 235 were promoted to the next stage of trial namely preliminary yield trial for the early and late seasons respectively. Co. 691, Co. 792, Co. 705 and Co. 729 were promoted to the main yield trial under early varieties.

Main yield trial of early varieties.—None of the varieties under trial proved superior to the standards Co. 419 and Co. 449, Co. 620 which was better in yield was susceptible to smut and wilt and Co. 659 which recorded good juice quality was poor in yield.

Preliminary yield trial of early varieties.—Four varieties, namely, Co. 793, Co. 705, Co. 729 and Co. 691, were found promising in this trial and they are promoted to main yield trials.

Time of planting and harvesting experiments.—Planting in January and harvesting by March recorded the highest yield of cane and sugar per acre. This was followed by ten months old crop of May planting. Planting in September recorded very low yield. Under all the conditions Co. 449 was superior to Co. 419. Under late planted conditions and for harvest at low age group Co. 449 is better than Co. 419.

Trial of Rayunganas.—The use of Rayunganas as seed material did not prove of high utility for wider adoption. The establishment of the Rayanganas in the field was low under lift irrigation conditions and the severe summer climate, Rayungans in combination with short cropping is noted to be a very rapid method of propagation of cane variety.

Chilcan Nitrate trial.—Chilean nitrate proved better than the normal manuring with groundnut cake and Ammonium Sulphate. But the results require further confirmation.

Pit planting trial.—The practice of planting sugarcane in pits is practiced in Mathurai district, was not found better than the local method of planting in trenches. The cost of preparing the pits was high compared to the preparation of trenches.

Lodging trial.—The studies indicated deterioration in Juice quality by lodging and loss in respect of population in late season harvest due to breakage etc., Co. 419 was found to be badly affected by lodging compared to Co. 449.

B. Other crops.—During the late season ASD. 5 paddy was planted in an area of 6·10 acres and the yield per acre was 1,519 lb. Unusually this year the entire area was affected by blast and hence the low yield as compared to 2,235 lb. of last year.

During the Navarai and Kar seasons TKM. 3 in 0·89 acre, TKM. 6, in 2·36 acres and Co. 13 in 1·48 acres were raised. TKM. 3 recorded an acre yield of 674 lb., TKM. 6, 2,906 lb. and Co. 13, 1,996 lb. respectively.

Ragi.—Co. 2 was raised in an area of 2·22 acres. The crop yielded 1,030 lb. of grain per acre.

Cotton Punjab 216 F.—Cotton Punjab 216 *F* was sown in an area of 0·95 acre and the crop yielded 320 lb. of kapas per acre.

Fodder cholam.—Cholam for fodder was raised in an area of 2·56 acres and an acre yield of 6,000 lb. of fodder (green) was obtained.

Green manure crops.—Sunhemp as green manure was raised in an area of 12·00 acres. Due to the drought conditions that prevailed in the early period the crop yielded only an acreage of 5,000 lb. of green leaf per acre. Sesbania speciosa was planted all along irrigation channels, along the side of paddy fields and along the bunds of Sugarcane fields. A total quantity of 324½ lb. of seeds was collected. Fourteen pounds of Glyricidia seeds were collected from the farm trees. Fiftytwo thousand and eighthundred cuttings of Glyricidia were distributed during this year; seedlings and Glyricidia stumps were also planted along the fence and farm border to provide live fence, besides supplying the green leaf.

Miscellaneous—Seed distribution.—Fifty-one thousand, three hundred and twenty-four lb. of sugarcane seed material, 15,408 lb. of paddy seeds, 1,057 lb. of ragi seed and 540 lb. of groundnut seeds were made available for distribution.

II. Programme of work for 1954–55.

I. *Sugarcane.*—(*a*) Seventy-two varieties of canes are being studied to find out their suitability to the tract and selection of more promising ones than the standard.

(*b*) The study of the early varieties, selected from the study plots in the preliminary yield trial.

(*c*) The study of late maturing types selected from the study plots and further trial on the preliminary yield trials.

(*d*) The final and concluding year of trial of the time of planting and harvesting experiment started in 1951 January.

(*e*) The study of Rayungans compared with the setts, to find out the suitability of the former as a seed material.

(*f*) Planting of sugarcane in pits as against the normal method of planting in trenches as practised in the Madurai district.

(*g*) The trial to find out the efficiency of Chilean Nitrate as a source of nitrogenous manure to sugarcane.

II. *Paddy.*—The following varieties will be tried in the early samba season along with two existing varieties, GEB. 24 and MTU 19, namely, Co. 25, ADT 25, BAM. 3, S.R. 26 B.

Cultures 1245 and 4388 will be compared again for the second year along with GEB 24 as control.

General.—Work on grafting and layering of Mangoes and oranges will be concentrated to produce grafts and layering on a large scale for supply to ryots. The planting of Glyricidia seedlings and Stumps will be concentrated to augment the supply of green leaf to the farm. Larger area under vegetables will be grown with the object of producing more vegetables seeds for supply to the ryots and the public.

The Agricultural Research Station, Koilpatti.

I. Results achieved in research during 1953–54.

A. Cotton breeding.—The distribution of the strain cotton K2 was further extended during the year with the help of the special K2 and Co.4 scheme staff. The four economic cultures evolved by the Assistant Cotton Specialist, Karunganni Scheme, Koilpatti, having a staple length of nearly one inch

were tested in district trials. The trials have indicated two cultures 6186-9 and 6874 to be suitable for the tract. They yielded as high as the strain K2. but have a superior quality of lint spinning up to 40 counts.

B. Millets breeding.—The main work of Millets Breeding was confined to (i) Cumbu (Rainfed), (ii) Irungu Cholam (Rainfed), (iii) Ragi (Irrigated) and (iv) Vellai Cholam (Irrigated).

(i) *Cumbu (Rainfed).*—Strain Cumbu K1 was distributed through seed farms. The hybrid strains XI and X12 were tried in this research station and in the districts of Madurai, Ramanathapuram and Tirunelveli. Their yields indicated that they do not suit the tract. Nine hybrid combinations giving significantly higher yield than the cumbu K1 have been fixed. Their high yield has to be confirmed.

(ii) *Irungu Cholam (Rainfed).*—A.S. 7081 an extracted type of a cross between Irungu cholam of Tirunelveli district and Periamanjal Cholam of Coimbatore was distributed in the tract through seed-farms. This has out-yielded the existing strain of Irungu cholam strain K2 giving 14 per cent higher yield of straw. Sixteen bold grained types of Periamanjal Irungu cholam have also been isolated.

(iii) *Ragi (Irrigated).*—Strain Ragi K1 was distributed through seed-farms. Although this strain is a good yield it has a defect, viz., it lodges at the time of seed setting. Four non-lodging types have been isolated in F5 generation (from a cross between strain Ragi K1 and an economic non-lodging types) and all four of them have given significantly higher yield than the strain Ragi K1. Another economic pure line Ragi K.R.4 with non-lodging habit recording higher yield than Ragi K1 has also fixed and has been given out for district trials.

(iv) *Vellai Cholam (Irrigated).*—Vellai cholam strain K2 was distributed through seed farms. Two economic cultures, viz., KS 288 and KS 296-54 giving significantly higher yield than the existing strain cholam K2 have been given out for district trials.

C. Agronomic studies.—(*a*) *Rainfed crops.*—Three Agronomic experiments, viz., New Cultural Experiment, (2) Cereal Indigo experiment with superphosphate and (3) cotton pulses mixtures trials were conducted during the year under report. The duration of the cotton crop got extended by the heavy rains received during the hot weather period. Hence the final picking could not be completed before the end of June.

(*b*) *Irrigated crops—Irrigation of black soil with brackish water.*—In Ramanathapuram and Tirunelveli districts, when wells are dug in black-soil, usually highly brackish water is obtained (400 to 500 parts of salts for hundred thousand). In many places wells have been dug and abandoned after two years of cultivation as the entire area became alkaline. But in some places where heavy doses of organic matter was used the cropping was a success. Invariably the crop grown was chillies as it is a paying crop. Trials at the Agricultural Research Station, Koilpatti indicated that Ragi, Periamanjal, Irungu and Vellai Cholam can be grown provided the crops receive at least 25 tons of compost per acre as a basal dressing. Regarding green manure it was noted that sunhemp is the best giving acre yield of 17,200 lb. of green matter which can be advantageously ploughed in.

D. Miscellaneous.—(1) *Selection of high yielding cultures for mixed cropping with cotton.*—Out of the six economic cultures sent by the oilseeds specialist five recorded higher yield than the control TMV2. which gave acre yield of 233 lb. of pods. The highest yielder was A.H. 6179 which recorded acre yield of 400 lb. of pods.

(2) *Coriander.*—Twenty-two (22) higher yielding types than the control strain No. 731 have been fixed.

(3) *Safflower.*—Rains received during flowering time of the crop reduced the yield to nearly a quarter. However selection C.T. 66 recorded the highest yield during this season also, indicating the suitablity of this selection to this tract.

(4) *Sweet potato.*—Bhadrakali type-1 has given the highest yield for the sixth year in succession. Its yield behaviour in the districts is awaited.

(5) *Permanent grasses.*—Under restricted irrigated condition Koluk-kattai grass is not able to maintain its high yield. A new introduction Blou-Buffel does well under Koilpatti conditions under restricted irrigated conditions and out yields the Guinea grass recording an yield of 80,420 lb. of green fodder per acre.

(6) *Lab-Lab.*—The season was not good for lab-lab crop. Still, D.L. 244 maintained its high yield giving 35 lb. of tender pods per pandal.

(7) *Chillies.*—The local selection No. 2 has given the highest yield. Sixty foreign types and 87 Indian types were studied. None of the foreign types appear promising. Among the Indian types, two types from Assam were found to be resistant to thrip and mosaic attack.

(8) *Potato.*—Due to heavy rains received during the crop growth the potato crop recorded a very poor yield. Even during this bad year O.N. 2186 recorded the highest yield of 1,450 lb. of tubers per acre.

E. Poultry.—Rhode Island Red breed of poultry was maintained. A small flock of 5 birds (viz., one cock and four hens) were maintained on an average during the period. From these birds, 488 hatching eggs were distributed in the 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 Indian game breed. The F2 generation was raised this year and two hardy birds recorded an average of 98 eggs per bird. The F3 generation is being raised from these two hardy birds.

II. Programme of work for 1954–55.

Cotton.—Evolution of high yielding strains under the Karunganni scheme.

Millets.—Evolution of strains in Irrungu Cholam Vellai Cholam and Ragi.

Agronomy.—The Agronomic experiments will be continued.

Miscellaneous.—Trials with sweet potato, fodder grass, chillies, vegetables and potato will be continued.

Poultry.—Poultry of the improved breeds will be maintained.

The Paddy Breeding Station, Mangalore (South Kanara district).

I. Results achieved in research during 1953–54.

A. Paddy—(i) *Pure line selection.*—It is proposed to release Halluga culture 1828, Kanwa culture 1958 and Mascathy culture 3159 as strains MGL. 3, MGL. 4 and MGL. 5 respectively for the first crop since they have consistently recorded higher yields. Two cultures of Bilikayama, a first-crop variety, are in the final stage of trial. Culture 2482 of Athikraya group, a second-crop variety is ready for release as strain. Reselection work on Mascathy and Halluga, two first-crop varieties, was also in progress this year.

(ii) *Improvement by introduction.*—The study of pure line cultures was continued with an addition of 32 strains and pure line cultures, received from other stations. In the trials of the early varieties during the first crop season, four cultures viz., PTB. 22, PTB. 25, PTB. 28 and a Chinese type CH 42 were found promising. Under the second crop conditions a dozen cultures found promising, were marked out for further trial.

(iii) *Improvement by hybridization.*—During the first crop season, the F. 2. progenies of two crosses, viz., MGL. 1×MTU. 3 and PTB 11×MTU 4 to evolve non-lodging type resembling MGL. 1 and PTB. 11 respectively and F2 progenies of cross Kasipichodi×PTB 9 to evolve an early non-shedding variety were examined and 56, 51 and 140 plants respectively were selected for further study. While during the second-crop season, the F2 progenies of PTB. 20×Co. 3 and Co. 3×8448 to evolve a non-deteriorating type resembling Co. 3 were examined and 166 single plants of the former cross and 150 of the latter were selected for further study. Fresh crosses of Co. 3 × PTB. 20, Co. 3× Muthusamba and Co. 3 × 8360 were effected.

Two hybrid cultures of Kavinginpoothala 8360 and 8448 which were under trial both at the station and the district, have retained their viability during the previous season. Another culture 8900/3 from among the economic progenies of the cross Co. 3 × PTB 19 under trial at the station proved promising by exhibiting non-deteriorating character combined with earliness and high yielding capacity compared to Co. 3 standard.

(iv) *Manurail trials.*—Four manurial trials were laid out during this year. In the study of deleterious effects (if any) of the continuous application of Ammonium Sulphate, indications were in favour of green leaf alone at 2,500 lb. which increases paddy yileds and the addition of Ammonium Sulphate showed no additional response. In the experiment to test the efficiency of Phosphates as manures, green-leaf was found to be significant over cattle manure on equal weight basis and there was not much difference in two levels of the two forms of Phosphate. From the other experiments the results have shown (i) that the strains would respond better under farm manuring conditions and (ii) that the chilean nitrate would be efficacious under the first crop conditions while Ammonium Sulphate would be preferred for the second crop.

(v) *Cultural trials.*—An experiment to compare the relative merits of Japanese system and Farm system of cultivation was laid out during the year. The Japanese system was found to be significantly better than the farm system of cultivation.

B. Green manures—(i) *Sesbania speciosa.*—With a view to find out the optimum conditions under which maximum quantity of green matter and seed could be obtained, the seedlings of Sesbania were grown as bulk in single and double-crop wet lands and along the periphery of the paddy fields also. During the monsoon months a pure crop of sesbania in the single crop area gave an outturn of 20,000 lb. of green matter per acre.

With closer planting of sesbania seedlings along the periphery of paddy fields, the outturn of green matter ranged from 500 to 1,200 lb. per acre under the first-crop conditions and 300 to 600 lb. under the second-crop conditions. The seedlings of Sesbania planted along the sides of channels and other moist places during November were found to be the best source for seed production.

(ii) *Glyricidia maculata.*—The plants along the main road, field bunds, main channel bunds and boundaries have grown well and yielded 20 tons of green matter during the first-crop season of 1954. The yield of green matter ranged from 20 to 50 lb. per plant. Up to the end of the period under report

a total number of 30,000 seedlings and 3,000 cuttings were planted along the bunds, vacant places and boundaries of the farm. A total number of 354,900 seedlings and cuttings was sold or transferred during this period.

(iii) *Indigofera teysmanii.*—Fourteen plants of Indigofera teysmanii, two to three years old, were in flowers and pods during the month of October. A total quantity of 7 lb. of seeds was gathered during the month of December. Scarifying the seed coat with sand treatment was found to give 60 to 80 per cent germination. Nurseries were raised to get enough seedlings for transplanting in between Glyricidia in the farm area.

(iv) *Tropical green manures.*—With a view to study the suitability of different species of leguminous and other plants as green manures under the local conditions, the seeds of 24 species of annuals and 8 species of perennials were sown in observation plots on 24th May 1954. Though it is too early to judge the merits and demerits of the plants as green manures, three annuals, viz., Crotalaria juncea, Sesbania aculeata and Phaseolus semicrectus and three perenials, viz., Crotalaria usaramoensis, Cassia leshchenaultina and Tephrosia candida, so far appear to be promising.

C. Other crops—(i) *Sweet potato.*—The manurial trial and the cultural trial started previously were continued and laid out during the first and second-crop seasons of the year under report. The two treatments, viz., (i) applying full dose of manure at planting and (ii) half the dose at planting and half at earthing up were on par during the first-crop season and in the second-crop season, applying full dose of manure at planting, was found to be significantly better than the other treatments. The results of the three years' trial indicate that applying full dose of manure at planting is the best. In the cultural trials planting in doubles was found to be better than in singles under the first-crop season while no difference was noted among the treatments in the second-crop seasons.

(ii) *Groundnut.*—The groundnut variety TMV. 2 was grown over an area of 30 cents after the second crop of paddy in the double-crop wet land under dry conditions. The crop recorded low acre yield of 150 lb. mainly due to droughty conditions.

(iii) *Miscellaneous crops.*—Pulses, bananas and vegetable crops were raised for trial and seed production.

Fodder grasses.—The seven varieties of grasses, viz., Cumbu-Napier hybrid grass, guinea grass, elephant grass, Thin Napier grass, buffalo grass, Australian drought resistant grass and blou-buffel were maintained during this year in the grass plot. The buffalo grass recorded the maximum yield of 38,627 lb. closely followed by the Cumbu-Napier hybrid grass which recorded 33,485 lb. The buffalo grass comes up well under both single and double-crop wet land conditions. Thin Napier was found to be an ideal grass for dry lands while the other grasses are generally grown where there are facilities for irrigation. A total number of 48,425 grass slips of all the varieties were distributed during this year.

(iv) *Cover crops*—(*a*) *Tropical Kudzu.*—The vines in the 'A' block bund newly planted ones in 'L' and 'M' block bunds have grown and spread over a wide area. Even during the period of summer, the vines were green and healthy. The plants flowered during the month of December and a total quantity of 7 lb. of seeds was gathered during the month of January.

(*b*) *Calopogonium mucunoides.*—Another cover crop introduced in 1951 is rapidly spreading in newly acquired area of the farm. The plants flowered in November and a total quantity of 7½ lb. of seeds was collected during the

month of December. These plants though dry up completely in summer, leave behind the disbursed seeds which remain viable till the break of monsoon when they sprout uniformly.

(c) *Centrosema Pubescens.*—This is another cover crop introduced in 1952 in this farm. This is shade-loving and remains green throughout the year. A small quantity of seeds was gathered during the period.

II. Programme of work for 1954–55.

Paddy.—Seed multiplication of promising strains, evolution of high yielding strains by selection and hybridisation will be continued. Manurial and cultural trials will be continued. Trials with sweet potato, green manures cover crops and fodder grasses will be continued.

The Cashew Research Station, Mangalore (South Kanara district).

I. Results achieved in research during 1953–54.

A survey of the plantations in the major cashew growing areas of the State was made and 96 promising selections were isolated. Seeds of exotic types from East Africa and Brazil were also added to the collections. In propagation trials cincturing proved to be promising as a method of vegetative propagation for this crop.

Annual programme of work for 1954–55.

Survey and establishment of a comprehensive collection of types, maintenance of progeny plot, standardization of vegetative propagational methods and multiplication of clonal progenies of promising types, blossom biological studies, trials to determine the optimum manurial and irrigation practices, etc., will be pursued.

The Agricultural Research Station, Nanjanad.

I. Results achieved in research during 1953–54.

A. Potato—(i) *Great Scot—Seed multiplication.*—The popular variety, Great Scot, was raised in the second and the irrigated seasons and recorded the excellent acre yields of 7,995 and 14,400 lb., respectively, as against the corresponding figures of 5,045 and 12,316 lb. of the preceding year.

(ii) *Cultural trials.*—Row spacing of 24 inches gave yields higher than the wider spacing of 27 inches.

B. Cereals—Rye for ergot production.—An area of 22·65 acres was sown but due to very poor infection, only 45·5 lb. of air-dry raw ergot were obtained.

C. Green manure—Lupins.—A record yield of 5,160 lb. of seed was obtained by raising the crop for seed in fields and uncultivated wastes.

D. Forage crops and grasses.—Several new introductions were under trial.

E. Miscellaneous—(i) *Seed supply.*—A total quantity of 74,525 lb. of potato seeds was disposed of.

(ii) *Exhibitions.*—One exhibition was held in connection with the Farmers' Day. The station partook in many local and mofussil exhibitions.

F. Scheme for soil conservation and terracing of lands at the Agricultural Research Station, Nanjanad.—In G.O. Ms. No. 461, Agriculture, dated 17th February 1954, a scheme was sanctioned for terracing of about 80 acres of the cultivated area of the station. Work was started with bull-dozing equipment at the end of March 1954 and a total of about 10 acres was covered up to the end of the period. The work is in progress.

II. Programme of work for 1954–55.

Potato.—(1) Multiplication of disease-free Great Scot and other promising varieties.

(2) Studies on ideal and profitable rotation practices for potato.

(3) Manurial trials with (*a*) different forms of nitrogen carriers, (*b*) divided doses of Nanjanad mixture and (*c*) Magnesium for fertilization. Trials on winter cropping of potatoes in different centres of the State will be undertaken.

Other crops.—New introductions of plants of economic importance will be undertaken.

The Agricultural Research Station, Palur.

I. Results achieved in research during 1953–54.

1. *Paddy—(a) Samba season.*—Blast resistant Sirumani Co. 25 has recorded the highest yield of 3,656 lb. per acre during the second crop (Thaladi) season. ASD 5 Karthigai Samba recorded a low acre yield of 1,613 lb. due to severe incidence of blast. In the Karthigai Samba yield trials during the Thaladi season the culture 5,108 which is a cross between Kavinginpoothala and ASD 5 gave the best yield and has given 23 per cent increased yield over Co. 2. In the increased yield experiments green leaf at 10,000 lb. per acre has recorded significantly increased yields. In the trial with the Japanese method of paddy cultivation it has not only given better yield than the farm method, but has also given better monetary return.

(*b*) *Navarai season.*—The inter-strain yield trials. Vellakar and Mottakar yield trials were a failure during this season due to severe incidence of blast.

2. *Millets.*—Ragi strain P. 1 was multiplied and distributed for raising primary seed farms. A manurial experiment with P. 1 ragi was conducted to find out the relative merits of ammonium sulphate and chilean nitrate when applied alone and in combination with lime, compost and super phosphate. During 1953–54 December-March season it was found that the control which received the basal dressing alone and the treatment with chilean nitrate alone at 60 lb. nitrogen per acre gave significantly lower yields than the other treatment which did not show any significant differences between themselves.

3. *Miscellaneous.*—Varietal studies of sweet potato showed that the variety I.B. 22 has given better returns than the local variety.

4. *Seed distribution.*—Paddy seeds to the extent of 26,177 lb., 1,545 lb. of ragi seeds, 82 lb. of varagu seeds, 30 lb. of red gram seeds, 310 lb. of oil seeds, 29 mango grafts, 197 lemon layers 96 lb. of prosops pods and 500 lb. of sesbania seeds were distributed.

II. Programme of work for 1954–55.

Paddy.—Varietal trials during Kar, Samba and Navarai seasons and seed multiplication of promising strains will be continued. Evolution of strains

through selection and hybridisation will be continued. Manurial experiments will be continued as in the previous year.

Ragi.—Varietal, manurial and mixed cropping trials.

Varagu.—P. 1 strain will be multiplied.

Groundnut, gingelly, redgram, cotton, tapioca, sweet potato varieties, vegetable and fruit plants will be raised. Fodder and green manure crops will be grown for demonstration purposes. Poultry unit will be maintained for distribution of eggs and chicks.

The Agricultural Research Station, Pattukkottai (Tanjore district.)

I. Results achieved in research during 1953–54.

Paddy—(*a*) *Kuruvai season*.—Varietal trials conducted with 5 short duration and 6 long duration strains indicated that ADT 20 among the former and ADT 14 among the latter, gave the maximum yields in the Kuruvai season.

In the trials with the Japanese method as against the Farm method, the former was found to give higher yields.

(*b*) *Samba season*.—As in the Kuruvai season, short and long duration varieties were under trials for fixing suitable strain for the samba season. Co. 25 among the long duration strains gave the highest yield.

In this season also trials indicated that the Japanese method gave high yields than the farm method.

(*c*) *Thaladi season*.—Sesbania grown as border crop in Kuruvai was used as green manure for the Thaladi paddy crop and an acre yield of 3,000 lb. of green manure was obtained. Among the three strains tried BAM 3 gave the highest yield.

Ragi.—Co. 2 and Co. 3 strains grown in rice fallows during summer gave rather poor acre yields.

Co. 2 .. .. 1,136 lb. Co. 3 .. .. .. 370 lb.

Groundnut.—TMV. 2 groundnut strain was raised in the rice fallows successfully by sowing in January after the harvest of the paddy crops. The crop comes to harvest in April, after which a green manure crop can be raised for the succeeding paddy crop.

Cotton.—P. 216 F cotton was raised in rice fallows to the extent of 2·49 acres. The crop was manured with super phosphate as basal dressing at 100 lb. per acre and ammonium sulphate as top dressing at 50 lb. per acre. The yields ranged from 230 to 600 lb. of Kapas per acre with an average of 460 lb. per acre. The harvest was completed in July 1954.

Green manures.—Green manures produced on the farm were sufficient for manuring all the paddy areas of the farm. Sesbania and sunnhemp as pure crops gave 25,000 lb. and 20,000 lb. per acre respectively. A total quantity of 625 lb. of sesbania seeds was collected from the border crop raised in Kuruvai paddy.

Vegetables.—Several varieties of vegetables and Sattur chillies were grown for trial.

Fruit plants.—Large numbers of seedlings of limes, lemons (rooted cuttings) jack, pomegranate were raised and sold. Selected fruit plants in sapota, mango grafts, lemons and pummelo were planted in the orchard area.

II. Programme of work for 1954–55.

Work on paddy improvement will be intensified with conversion of the post of the Farm Manager into a Research Assistant.

Millets, groundnuts and cotton will be continued for trial in rice fallows.

Cultivation of vegetables and chillies will be continued.

The fruit orchard with the nursery for raising choice seedlings, cuttings and grafts will be continued for demonstration and supply of seed material.

The Agricultural Research Station, Paramakudi (Ramanathapuram district).

I. Results achieved in research during 1953–54.

General.—This station was opened from 1st April 1953. The object of the station is to raise the standard of cultivation of the zamin areas of Ramanathapuram and Sivaganga and make them well-irrigation minded. The site for the farm chosen is almost in the centre of the two zamins and is also typically representative of the tract. It has been decided to carry on both research work on paddy through the well-recognized methods of plant breeding and by agronomic means to get the best out of local conditions here and in the adjoining areas of Tirunelveli and Madurai districts.

Out of the 25·40 acres of lands acquired for this station 10·50 and 14·90 acres are under garden and wet lands respectively with meagre water facilities at present.

A total area of 23·19 acres was cultivated during the period under report with paddy (14·89 acres), millets (6·49 acres), groundnuts (0·40 acre), castor (1·01) acres and greengram (0·4 acre) as the important crops.

Vegetables such as bendai, gourds, amarantas cowpeas, spinach and cluster beans, were also grown in small patches.

Seed distribution.—The following are the quantities of seeds grown and distributed from this farm:—

(1)	Production. (2)	Distribution. (3)
	LB.	LB.
1 Paddy	6,860	4,355
2 Millets	4,008	..
3 Vegetable seeds	80 lb. $1\frac{3}{8}$ oz.	58 lb. 9 oz.
	LB.	LB.
4 Green Manure seeds: Sesbania speciosa.	1,467	800

II. Programme of work for 1954–55.

Crops.—Trials with varieties of paddy, millets, groundnuts, castor and pulses will be carried on.

Evolution of superior strains will be pursued. Raising of green manure crops and vegetable will form a regular feature.

Promising varieties and strains will be multiplied for seed production and distribution.

The Agricultural Research Station, Satyamangalam (Coimbatore district).

I. Results achieved in research during 1953–54.

Field experiments and investigations.—The field experiments consisted in the main, in finding out suitable methods of improving the fertility status

and physical texture of the soils, by application of green leaf manure, cattle manure and compost in different doses and by growing a number of legumes and ploughing them *insitu* to find out the best one to produce high tonnage and increased yields in cotton and millets. Of the several doses tried (2,500 lb., 5,000 lb. and 7,500 lb.) good response was noted in growth and earliness with the higher doses both on millets and cotton. But in the shorter duration crops like millets, the effects were not sustained in the yields. With cotton there was significant increase by 7,500 lb. application, in the yields with both the green manures, irrespective of the variety and with cattle manure. The results indicate the possibility of using cheap green manure from the Glyricidia plantings and sesbania to improve the soils. The above results are also suggestive of further trials with higher doses of green manure.

In the irrigation experiments conducted, one inch in five days tended to give slightly greater straw yields with millets and improved yields with cotton raised in beds. Of the crop varieties tried, ragi Co. 1 was found to fare better than others in both the first and second season. Co. 13 cholam was found suited to the second season which is also noted to fare well in the summer season. Among the groundnut strains both T.M.V. 3 and T.M.V. 2 appear to do well in the first season. In the second season T.M.V. 2 was outstanding with high yields.

Pot culture experiments confirmed the beneficial effects of high doses of green manure on cotton. But the response was also noted with millets in grain yields unlike in the field experiments. In the experiment with varieties of legumes Cowgram was found to increase the nitrogen content of the soil incorporated in the pot.

Sesbania and Glyricidia were grown wherever possible to augment the green manure supply.

Green manures.—Twelve thousands seedlings and cuttings of Glyricidia were planted extensively along the main bunds and over 200,000 of Sesbania seedlings along the water channels and 460 seedlings of pungam along the fence. The loppings from Glyricidia planted earlier and Sesbania harvested gave nearly 15 tons of green manure, besides 650 lb. of Sesbania seeds collected from the standing plants before harvest. Two hundred Indigofera teysmanii seedlings planted are coming up well and most of them started flowering six months after transplanting.

From the farm wastes, nearly 50 tons of compost were prepared and 100 tons are ripening in the pits. Six more pits were opened during the year, to prepare at a time nearly 150 tons of compost.

The area under vegetables was increased from 37 cents to 57 cents. Eighteen tapioca varieties have been got and planted over 5 cents. A small plot of about 4 cents has been planted to jasmine and roses to get some additional income.

Fodder was raised on the farm besides encouraging grass growth on the bunds which gave about 45,000 lb. of grass.

Farmers' Day.—On the station Farmer's Day was held on 31st December 1953 when over 200 farmers from nearby villages Bhavani, Dharapuram and Erode attended. An exhibition was arranged with charts and strains of crops from the crop specialists.

II. Programme of work for 1954–55.

Field experiments for improving the fertility of soil under irrigation as green manuring, application of cattle manure and compost will be carried on with cotton and millets.

Irrigation experiments with cotton and millets will be continued.

Groundnuts, vegetable and fodder crops will be raised in the main and second seasons.

The Agricultural Research Station, Taliparamba (Malabar district).

I. Results achieved in research during 1953–54.

(*a*) *Paddy*—(i) *Paddy strains.*—The yield trials of different strains of paddy confirmed the previous finding that P.T.B. 9 was the most suitable for the tract in the first crop season.

(ii) *Trial of compost made of dried jack leaves, mango leaves and cashew leaves for manuring paddy.*—The trial to assess the comparative merit of compost made with dried leaves of jack, mango and cashew carried out during the year showed that jack leaf compost was superior to mango leaf compost and cashew leaf compost. The paddy crop was found to respond well to compost made of mango leaf and cashew leaf also. The trial has shown that large quantities of dry cashew leaves available on the West Coast which is seldom used for any manurial purpose can be advantageously utilized for preparing compost for manuring paddy.

(iii) *Irrigated paddy crop.*—For the first time an irrigated crop of paddy was raised in the station. P.T.B. 10 was grown irrigated in an area of 2·42 acres from February to May 1954 by pumping water from the stream along the boundary of the station. The crop recorded an acre-yield of 2,366 lb. and showed that irrigated crops of paddy can be profitably grown in this locality in the summer months by pumping water from suitable sources. Irrigated paddy crop is very seldom raised in Chirakkal taluk.

(*b*) *Chilli—Yield trial of different types.*—The comparative yield trial of three types of Chilli, South Malabar, G. 1 and G. 1,402 did not show significant superiority of any one type over the others in respect of yield of ripe pods. However it was found that the dryage ratio of the Guntur types is higher than that of South Malabar.

(*c*) *Fruits*—(i) *Sapota rootstock trial.*—From the data and observations recorded from the trial it is found that *Mimusops-hexandra* seedling is a more suitable rootstock than seedlings of sapota and *Madhuca longifolia.*

(ii) *Mango hybridization.*—A total number of 613 controlled pollinations involving eight parental combinations was made during the period under report and 18 fruits of six parental combinations have resulted from these controlled pollinations. The fruits are attaining maturity and the stones are expected to become available for sowing in July 1954.

(iii) *Blossom biological studies of jack and jack hybridization.*—From studies on blossom biology of jack the opening of flowers was found to start from the base of the spikes, two to three days after the emergence of the spike from the bracts. All the flowers on a male catkin were found to finish flowering within four days of commencement of flowering. The another dehiscence was found to commence from 19·00 hours and the maximum dehiscence was found to be between 20·30 hours and 21·00 hours.

Two crosses consisting of two parental combinations were made and the seeds resulting from these crossed fruits were sown for raising hybrid seedlings. Besides, seeds of fruits resulting from selfed spikes of these two trees were also sown.

(iv) *Other trails.*—For initiating (i) trial of hormones on pine-apple, (ii) trial of forcing the growth of pine-apple suckers from stem slices, (iii) pine-apple varietal trial, (iv) jack rootstock trial and (v) mango polyembryonic rootstock trial, preparing the necessary planting material was in progress.

(*d*) *New introductions of fruit and other crops.*—During the period under report, six varieties of mango, seven varieties of sapota, six varieties of lemons, two varieties of guava and Sathugudi orange were introduced and planted out.

In addition, seedlings of three new varieties of arecanut were raised. Nutmeg, clove, kolanut, vanilla and cacao introduced previously have established and are making satisfactory growth.

Other crops—(i) *Arecanut.*—The yield of arecanut during the period under report was 116,289 nuts as against 129,020 nuts in the previous season. The comparatively lower yield in the period under report was due to the severe drought during 1952–53.

(ii) *Coconut.*—The yield of nuts was poor and was only 3,921 as against 8,932 in the previous year. The low yield of nuts during the period under report was due to the severe drought during 1952–53.

(iii) *Cashew.*—The yield of cashew was very good and a total quantity of 3,193 lb. of nuts was obtained from nearly 1,000 trees in the station.

(iv) *Vegetables.*—An area of 1·36 acres was grown to summer vegetable. During the period under report a total quantity of 379 lb. of vegetable seed was collected. In addition, 3,734 lb. of ash gourd has been retained for seed extraction.

(v) *Betelvine.*—Betelvine cuttings were planted to 50 arecanut trees in the Wet land paramba.

(vi) *Green manure.*—During the period under report 39,000 Glyricidia seedlings were planted in all suitable places and most of these have established.

Planting of Indigofera teysmanii seedlings in suitable places was taken up in June 1954 and a total number of 1,800 seedlings was planted.

Green manure crops of Crotalaria striata and sesbania speciosa were raised in 5·00 acres and one acre respectively.

(vii) *Cover crop.*—Calapogonium mucunoides was found to be a very quick growing and suitable cover crop. An area of 27·6 acres planted to perennial crops was sown to Calapogonium. The crop has already established well. A quantity of 800 lb. of seed was collected for distribution and for extending the area under the cover crop in the station.

The cover crop of Centrocema, first sown in 1948, has established very well in an area of 0·75 acre. Fifteen pounds of seeds were collected and sown in an area of 3 acres.

Various green manure crops and cover crops have been put under trial to select the most suitable for extension and popularisation in due course.

(viii) *Seeds and plants distributed.*—The undermentioned seeds and plants were distributed from the station during the period :—

Paddy seeds	12,750 lb.
Vegetable seeds	209 lb. 13 oz.
Cashew seeds	1,209 lb.
Jack grafts	20 Nos.
Mango grafts	2,338 ,,
Sapota grafts	180 ,,
Jack seedlings	938 ,,
Arecanut seedlings	2,155 ,,
Malta lemon plants	1,181 ,,
Pepper cuttings	3,727 ,,
Pine-apple suckers	202 ,,
Miscellaneous seedlings	5,055 ,,
Calapogonium seeds	643 lb.

II. Programme of work for 1954–55.

I. *Paddy.*—(1) Comparative yield trials of different strains of paddy to determine the most suitable first crop strain for the locality.

(2) Pure line selection in Kurum Kayama to evolve a high yielding strain in the variety which is a very important are grown during the first crop season in Chirakkal taluk.

(3) Hybridization between strains P.T.B. 9, MTU. 3, MTU. 4, to evolve a non-lodging high yielding strain for the first crop.

(4) Manurial trial on paddy to find out how far the application of Ammonium Sulphate continuously for a number of years will result in poor yield of paddy later.

II. *Chillies.*—Comparative yield trials of different types of chillies to test the comparative merits of Guntur types against local type.

III. *Groundnut.*—Trial of short duration bunch type of groundnut strain in rice fallows to find out how far cultivation of groundnut after harvest of paddy will be successful.

IV. *Fruits*—(1) *Pine-apple hormone trial.*—Necessary planting material will be got ready and the trial will be laid out in July-August 1954.

(2) *Pine-apple varietal trial.*—The necessary planting material will be got ready and the trial planted out.

(3) *Trial on forcing pine-apple suckers from stem slices.*—Sufficient suckers of variety Kew will be raised from stem slices for initiating the trial and the trial initiated.

(4) *Sapota rootstock trial.*—Data regarding growth increments will be recorded and analysed.

(5) *Jack rootstock trial.*—The rootstock trial with grafts of jack on two rootstock, jack seedling and Artocarpous hirsuta seedling will be planted out.

(6) *Jack blossom biological studies and jack hybridization.*—The studies and hybridization will be continued and F-1 progenies will be planted in a block for the study of their performances.

(7) *Mango hybridization.*—F-1 seedlings will be raised and planted for isolating promising ones. Further controlled pollinations will be carried out.

(8) *Polyembryonic rootstock trial.*—Grafts from a single Baneshan tree on the three rootstocks Olour, Bappakai and Puliyan, will be raised and the trial planted out.

The Rice Research Station, Tirukuppam (Chingleput district).

I. Results achieved in research during 1953–54.

Paddy improvement work.—Selection work was continued in the main varieties for samba and navarai seasons. Seeds of promising strains were multiplied.

Hybridization.—Work for evolution of high yielding, disease and drought resistant strains was under way. Eleven progenies of TKM. 2 and BAM. 3 and MTU. 4 and three of TKM. 2 X wild paddy were carried forward for further study.

Manurial experiments.—In the experiment conducted in samba season to find out the feasibility of green manuring semi wet paddy, reliable data could not be obtained since continuous rain immediately after sowing affected both the green manure and paddy crops. In the previous year, the plot treated with green manure gave 46·1 per cent and 69·4 per cent increased yields of grain and straw respectively over paddy sown alone. In residual effect on equal Nitrogen basis, it was seen that the night soil compost and farm yard manure were on a par and significantly superior to no manure. In the co-ordinated set of manurial experiment on rice it was seen that sesbania gave significantly the best yield of green matter followed by daincha and sunnhemp. The yields of green matter from the plots receiving phosphate and no phosphate were in par and in respect of yield of paddy, treatment differences were not significant either for grain or straw.

In Dicalcium phosphate experiment, Dicalcium phosphate and super phosphate were on a par but broadcast application of Dicalcium phosphate and super phosphate was superior to placing the manures. When placed, the phosphatic manures did not have any effect on grain yield since both the fertilisers when placed were on a par with groundnut cake alone. In the Japanese method of rice cultivation *versus* farm method, the results showed that the Japanese method though it gave higher grain yield than the farm method, the extra yield was not commensurate with the expenditure incurred in the Japanese method.

Mixed cropping.—In the experiment with Madras Uganda 1 cotton with rainfed paddy TKM 1 acre yields of 190 lb. and 209 lb. of paddy were obtained in cotton and control plots respectively. The yield of cotton was poor and worked to 23 lb. per acre due to continuous rainfall after sowing and the complete absence of rains in the hot weather period.

Other crops.—Crops of ragi, gingelly TMV 3 and tapioca were grown and acre yields of 2,000, 258 and 12,339 lb. respectively were obtained. P. 216 F cotton in rice fallows gave an acre yield of 1,000 lb. of Kapas. Vegetable crops, fodder grasses, fruit plants and green manure crops, and trees were grown.

Seed distribution—

Paddy seeds	13,977 lb.
Ragi seeds	1,614 ,,
Gingelly seeds	38 ,,
Groundnut seeds	50 ,,
Vegetable seeds	38 ,,
Sesbania speciosa	27 ,,
Glyricidia maculata cuttings	150 Nos.
Tapioca cuttings	5,400 ,,
Fruit plants	141 ,,
Paddy	48 cents.
Sesbania seedlings	15 ,,

II. Programme of work for 1954–55.

Paddy.—Selection and hybridization work for evolution of high yielding strains will be pursued. Manurial experiments will be continued.

Insecticidal trials for control of rice stem-borer and mealy bug and growing of cotton as a mixed crop with rainfed paddy, perennial cotton, green manures fodder crops and fruit plants and vegetable will be continued.

The Agricultural Research Station, Tindivanam.

I. Results achieved in research during 1953–54.

A. Groundnut.—Among the three bunch extra state strains the strain from Mysore, HG. 5 recorded the lowest yield while the strains from Madya Pradesh and Bombay were on par with TMV. 2 strain. Spreading strains from Uttar Pradesh and Punjab were poor yielders. Compared to the local strains, one of them (Local Samrala) was on par with the local groundnut. Three selections from Local Mauritius tested for the third time were found to be poorer compared to the strains. Out of the 14 big seeded selections tested in two series of comparative yield trials, only one selection recorded significantly increased yields over TMV. 3 and two selections over TMV. 1. The yield differences were not statistically significant in the preliminary yield trial with seven dormant bunch selections and TMV. 2. Eight spreading selections were tested under preliminary yield trials and six among them recorded higher yields than the local and one over the strain TMV. 3. In the replicated row tests of bunch and spreading selections none was found to yield significantly higher than the controls TMV. 2 and AH 1. Nine bunch selections and 26 spreading selections were on par with the controls. Out of 151 bunch and 184 spreading selections under row tests sixty-seven bunch and seventy-one spreading selections out-yielded their adjoining controls. Twenty-four new crosses were effected and the progenies of earlier crosses were studied. During the season 340 single-plant selections were made from varieties and progenies of cresses. In the rotation experiment the difference in yield of groundnut following groundnut and groundnut following cereals was not significant. Cereals following groundnut fared better than cereals following cereals. In the cultural and mixed cropping experiment no conclusive results were obtained. In the manurial experiment highest level of K_2O, in combination with cattle-manure, gave increased yields. In the preliminary experiment with different spacings, it was found that wider spacings between rows and closer spacings within the row resulted in increased yields and facilitated mechanical intercultivation at cheap cost. TMV 2 extract was found to have some effect in breaking the dormancy of the spreading groundnut seeds.

B. Gingelly—1953–54 *cold weather.*—Twenty-two selections were tested in replicated row tests along with local gingelly but the yield differences were not statistically significant. In the row tests, out of 21 selections, six outyielded their adjoining controls. All the collection of varieties was grown and studied and 465 selections were made from them.

1954 *summer.*—Two selections from varieties have been sown under comparative yield trials along with the local TMV. 1 and TMV. 3 for the final time. Nine selections from varieties and progenies of crosses were put under preliminary yield trials in two separate series. Fifteen selections have been sown under replicated rows for comparing their yield performances. Eighteen selections were sown in single rows with a control row of TMV. 3 after every two selections. Fourteen selections have been raised for seed multiplication. All the varieties and the new collections have been raised in small plots for detailed study.

C. Castor.—The three strains from Bombay, Uttar Pradesh and Madhya Pradesh recorded lower yields than the local strains. Five selections from progenies of crosses tested under comparative yield trials were on par with the TMV. 2 strain but significantly lower than TMV. 1. The selections were shorter in duration by one to one-and-a-half months than the strains. Three promising cultures were sent for trials in the districts and their performance was good. None among the thirty-two selections under replicated row trials yielded higher than the controls TMV. 1 and TMV. 2 while eleven were on par with TMV 1 and eighteen were on par with TMV. 2. Out of seventy selections under purity studies, twenty were found promising. Crosses were attempted between selected pureliness to evolve short duration high yielding type and to impart distinct colours to the strains. Progenies of previous crosses were raised and studied.

D. Miscellaneous.—The area sown to fodder *cholam* and paddy was increased from seven acres to twelve acres with a view to achieve self-sufficiency in the fodder requirements. The production of vegetables and their seeds was intensified. The production of bulky organic manures during the year was nearly 50 per cent more than in the previous year and nearly thrice that of 1951–52. Gliricidia and sesbania were raised on an extensive scale on the station and large number of seedlings of these were distributed to the cultivators. A tractor stationed for the scheme of mechanical cultivation of groundnuts was hired out to the neighbouring ryots with a view to step up the revenue.

E. Seed distribution.—The following materials were distributed during the year :—

	LB.
Groundnut seed pods	11,674
Gingelly seeds	1,525
Castor seeds	34
Paddy seeds	10,160
Vegetable seeds	34
Ragi seeds	187

II. Programme of work for the year 1954–55.

A. Groundnut.—Selection and hybridization for evolution of superior strains will be continued.

Manurial experiments.—A new manurial experiment to determine the best method of application of manures and the best combination of fertilizers to groundnut will be laid out adopting three methods of application and two complete manure mixtures.

Cultural experiment.—The experiment will be repeated with the same treatments and layout as in the previous years, but a mixed crop of groundnut and cholam will be grown instead of a pure crop of groundnut.

Rotation experiment.—The experiment will be repeated adopting the same cultural operations, manuring and layout as in previous years.

Mixed cropping of groundnut and cotton.—The experiment will be repeated for the fourth year with the same treatments as in the previous years.

Spacing trials.—A rainfed trial adopting four different spacings with wider spacing between rows and closer spacing between plants in the row will be laid out. Labour saving implements will be used for inter-cultivation in the wider spacings and the economics of the defferent spacings worked out.

Mixed cropping of summer groundnut, ragi and cotton.—Spacing trials will be repeated.

B. Gingelly.—Selection and hybridization work will be continued in cold weather and summer crops.

Manurial experiments.—A new manurial experiment will be laid out to determine the effect of applying chilean nitrate to gingelly in comparison with ammonium sulphate in graded doses.

Cultural experiment.—A new experiment with seven cultural treatments will be laid out for determining the optimum cultivation to be given to the gingelly crop.

C. Castor.—Selection and hybridization work will be continued.

Maintenance of purity and vigour of strains.—The single plants selected from all the three strains will be tried in progeny row trials in isolated blocks and the best among them marked out for maintenance of purity and vigour.

Maintenance of inbred lines will be grown and selfed seeds from each type will be gathered for further maintenance.

The eight ornamental types will be grown and large quantities of selfed seeds obtained for distribution to the public.

Regional Millets Station, Tiruppattur (North Arcot district).

I. Results achieved in research during 1953–54.

Tiruppattur.—Five selections of Talaivirichan cholam were superior to local bulk in yield trials and one of them T.S. 29 was sent for trials in North Arcot and Salem districts. Sixty-four promising selections were advanced to preliminary yield trials and further studies. In ragi, four selections were promising in preliminary yield trials. One selection of samai and three of varagu gave higher yields than their respective standards. Two selections of red-gram and three of Lablab gave increased yields over their respective standards. The total quantity of seeds supplied from the station was 525 lb.

II. Programme of work for 1954–55.

Tiruppattur—(i) *Millets.*—Evolution of high yielding strains by selection of Talaivirichan cholam, Irrigated Vellai and Sen cholam, ragi (rainfed and irrigated) samai and varagu.

(ii) *Pulses.*—Evolution of high yielding strains of redgram, horsegram and Lablab (field variety).

The Agricultural Research Station, Pilicode (South Kanara district).

I. Results achieved in research during 1953–54.

It was found that ash can be substituted by potassium sulphate or muriate of potash on equivalent K_2 basis for manuring coconut gardens without affecting the yields of coconut. The maximum net return was obtained when coconut garden was ploughed thrice during the year.

Peuraria phaseoloides and Calopogonium mucunoides were found to be good green manure *cum*-cover crops for the coconut garden.

A total of 3,401 seed nuts of the tall × dwarf cross = pollinated last year were harvested for raising seedings for distribution.

Among the exotic varieties of coconut, Laccadive Ordinary, Laccadive Small, Andaman Ordinary, Cochin China and Philippines continued to be promising.

II. Programme of work for 1954–55.

1. *Manurial experiments on adult coconut trees.*—(*a*) To find out the best method of applying manures in gravelly laterite soils.

(*b*) To find out a suitable substitute for ash for manuring the coconut.

(*c*) To compare the effects of chilean nitrate and ammonium sulphate on the coconut.

(*d*) To find out the effect of liming coconut soils.

2. *Cultural experiments.*—(*a*) To find out the effect of ploughing the coconut garden and digging with mammutty on the yield of nuts and to determine the minimum number of ploughings required to be given to get maximum yields.

(*b*) To find out the correct depth to which the coconut garden raised in gravelly laterite soils has to be ploughed or cultivated.

3. *Button shedding.*—Trial of proprietary chemicals to control button shedding.

4. Trial of newly introduced green manure crops.

5. *Coconut breeding.*—(*a*) Comparative study of self, nature and cross-pollinated seedlings.

(*b*) Study of progenies of crosses.

(*c*) Production of hybrid nuts of Tall × Dwarf by cross-pollination.

(*d*) Study of F2 progenies of Tall × Drawf crosses.

(*e*) Effecting crosses between the tall and spikeless varieties.

6. *Study of exotic and State varieties of coconut.*

The Agricultural Research Station, Nileshwar II.

I. Results achieved in research during 1953–54.

Observation and study of the progenies of cyclic crosses showed that the progenies of crosses involving high yield, high female flower production and thick meat are promising. Progenies of high yielding parent palms were in general better than those of low yielders. Selfed progenies were the least vigorous. Progenies of the Tall × Dwarf were the most outstanding. The F2 progenies of this cross were also quite vigorous. Among the crosses with exotic varieties, the progenies of Laccadive × Chowghat Dwarf and Strait Settlements × Andaman Dwarf were promising.

Crotalaria striata continued to be the best green manure crop for coconut gardens. Peuraria phaseoloides and Calopogonium mucunoides were found to be good green manure-*cum*-cover crops for coconut gardens.

Sweet-potato, tapioca and groundnut were the best subsidiary crops for the coconut garden fetching the highest monetary return.

II. Programme of work for 1954–55.

1. *Increasing, the humus content of the soil.*—Trial of newly introduced green manure crops.

2. Effect of liming coconut soils.

3. *Coconut breeding.*—

(*a*) Comparative study of self, natural and cross-polinated seedlings.

(*b*) Study of progenies of crosses.

(*c*) Production of hybrid nuts of Tall × Dwarf by cross-pollination.

(*d*) Study of F2 progenies of exotic variety corsses.

(*e*) Effecting crosses between the tall and spikeless varieties.

The Agricultural Research Station, Nileshwar III.

I. Results achieved in research during 1953–54.

Flood irrigation to coconut trees in summer months brought about an all round improvement in the condition of the trees.

Planting coconut seedlings in 3 feet deep pits in sandy soil with a high water table is definitely more advantageous than planting them 6 feet deep pits.

Pueraria phaseoloides and Calopogonium nucunoides were found to be good green manure-*cum*-cover cross for the coconut garden.

A total of 56,252 selected coconut seedlings of the tall, Tall × Dwarf and exotic varieties were distributed during the year.

II. Programme of work for 1954–55.

1. Trial of newly introduced green manure crops.

2. *Depth of planting experiments.*—Observations on the young plams will be continued.

3. *Irrigation experiment.*—To find out the effect of irrigating coconut trees in sandy soils at varying intervals during summer months on the yield of nuts.

4. Production of selected coconut seedlings for large scale distribution.

Government Botanic Garden, Ootacamund and Sim's Park, Coonoor.

I. Results achieved in research during 1953–54.

Floricultural records gathered in respect of the several annuals, shrubs and trees were useful in the designing of mixed borders. Complete descriptions of the several species of Eucalyptus and varieties of roses have enabled their identification through vegetative character. A study of the several Eucalyptus species for their oil contact showed that 31 out of 34 species yielded oil of which *E. amygdalina* gave the maximum of 0·65 per cent. Germination studies showed that seeds of *E. globulus* remained viable up to 30 months in storage.

II. Annual programme of work for 1954–55.

Growth, flowering and performance studies of shrubs and trees, acclimatisation and seed multiplication of annuals, introduction of new kinds and varieties germination and propagation studies in seed and trees will be pursued.

Pepper Research Station, Panniyur Malabar district.

I. Results achieve in research during 1953–54.

A technic for controlled pollination was devised. Hybrid seedlings in three parental combinations were raised. Trials to standardise methods of propagation resulted in the new finding that pepper could be inarched to other varieties.

II. Annual programme of work for 1954–55.

Survey and collection of pepper varieties, hybridization, manurial and cultural trials, studies on the incidence of pollu, wilt and spike shedding vegetative propagation studies and rootstock trials, etc., will be continued.

XI. CROP SAMPLING.

This is the Fourth Annual Report on the Five-Year Co-ordinated Scheme of Crop-cutting Experiments and satistical assessment of the results due to Grow More Food aids. It relates to the period 1st October 1953 to 30th June 1954 of the fasli 1363.

During this period the conduct of crop-cutting experiments was continued as in the previous year on the prinicpal food crops, viz., paddy, cholam, cumbu and ragi ; the experiments for the statistical assessment of the results due to Grow More Food Aids were confined to the three prinicpal aids, viz., improved paddy seed, green manure and ammonium sulphate.

2. *Staff and administration.*—The technical control of the work vests in the Director of Statistics. The post of the Special Deputy Director of Agriculture (Crop sampling), Madras, was converted into that of Senior District Agricultural Officer (Crop Sampling). However, the post of the Special Deputy Director of Agriculture (Crop sampling) was continued till 21st January 1954 since the actual separation of the Andhra staff of this department was given effect to from 31st December 1953 afternoon and the senior District Agricultural Officer posted, took charge on 21st January 1954 afternoon. In the revised set up, the post of the Special District Agricultural Officer (Crop sampling), Madras, who had jurisdiction over the districts of Chingleput, Nellore and Chittoor was abolished. Nellore and Chittoor districts formed part of Andhra State and Chingleput district was brought under the jurisdiction of the Special District Agricultural Officer (Crop Sampling), Salem, in addition to Salem and North Arcot districts.

As in the previous years crop-cutting experiments on paddy and the statistical assessment of Grow More Food Aids results were attended to by the Agricultural Demonstrators while the Revenue Inspectors were in charge of the experiments on millets. In general, the experiments on paddy and Grow More Food Aids were conducted satisfactorily while the same could not be said of the experiments on millets. This position was obviously due to the Revenue Inspector's pre-occupation with the manifold work entrusted to them and partly due to the fact that strict supervision and control could not be exercised on them by the officers in charge of the work as in the case of the Agricultural Demonstrators.

3. *Work done.*—Despite the dislocation of work attendant on the many changes in the personnel due to separation of Andhra State, every effort was taken to ensure the successful conduct of crop-cutting experiments.

Appendix 16 gives the number of days toured, villages visited and the experiments inspected by the Special Deputy Director of Agriculture (Crop Sampling)/Senior District Agricultural Officer (Crop Sampling) at headquarters and the Special District Agricultural Officers who toured on the average 173½ days, visited 105 villages and inspected 130 experiments at different stages during the period 1st October 1953 to 30th June 1954. The Special Deputy

Director of Agriculture (Crop Sampling)/Senior District Agricultural Officer (Crop Sampling) toured for 118 days, visited 56 villages and inspected about 58 experiments during the period.

4. *Progress of experiments.*—The progress of experiments during the period 1st October 1953 to 30th June 1954 in respect of paddy, Grow More Food Aids experiments and millets is given in Appendices 17–29 respectively. The highest and lowest number of experiments completed and could be considered for analysis with reference to the total number of experiments planned in the several regions was as shown below :——

Experiments.	Highest	Lowest.	Remarks.
Paddy I	98·2 per cent in Tanjore.	68·4 per cent in Salem.	
Paddy II	95·7 per cent in Madurai.	83·2 per cent in Salem.	
Paddy III	80·0 per cent in Salem	75·0 per cent in Tanjore.	Experiments were conducted on paddy III period only in Tanjore and Salem districts.
Grow More Food Aids Improved Seed.	80·0 per cent in Madurai and Tanjore.	64·3 per cent in Salem.	No experiments were planned in Shoranur region.
Green manure	78·6 per cent in Tanjore.	28·0 per cent in Salem.	
Ammonium sulphate ..	100 per cent in Shoranur.	71·4 per cent in Salem.	
Millets—			
Unirrigated ragi ..	53·3 per cent in Tanjore.	34·3 per cent in Madurai.	
Do. cholam ..	53·04 per cent in Salem.	36·3 per cent in Shoranur.	
Irrigated cholam ..	86·5 per cent in Tanjore.	33·3 per cent in Madurai.	
Do. cumbu.	56·0 per cent in Shoranur.	40·0 per cent in Salem.	
Unirrigated cumbu ..	55·7 per cent in Shoranur.	32·3 per cent in Madurai.	
Irrigated ragi I ..	71·4 per cent in Tanjore.	48·6 per cent in Shoranur.	
Do. Ragi II	100 per cent in Shoranur.	Nil in Madurai.	

Taking all categories of experiments under Paddy, Grow More Food Aids and Millets the progress was as given below :—

	Planned.	Completed and considered for analysis.	Procntage.
I. *Paddy*—			
Salem	340	276	81·2
Tanjore	400	374	93·5
Shoranur	360	344	95·6
Madurai	376	359	95·5
Total ..	1,476	1,353	91·7
II. *Grow More Food Aids*—			
Salem	53	34	64·2
Tanjore	116	96	82·8
Madurai	62	49	79·03
Shoranur	21	20	95·2
Total ..	252	199	79·0

	Planned.	Completed and considered for analysis.	Percentage.
III. *Paddy and Grow More Food Aids together.*—			
Salem	393	310	78·9
Tanjore	516	470	91·2
Madurai	438	393	89·7
Shoranur	381	379	99·0
Total..	1,728	1,552	89·8
IV. *Millets.*—			
Salem	1,106	560	48·3
Tanjore	720	404	56·1
Madurai	880	360	40·9
Shoranur	560	278	49·6
Total ..	3,266	1,602	49·1

From the Statement III above it would be seen that the percentage of experiments completed to the number planned was highest in Shoranur being 99·5 per cent while it was lowest in Salem Region being 78·9 per cent. In regard to millets, Tanjore region had the highest percentage with 56·1 per cent and Madurai region had only 40·9 per cent. For the Residuary State as a whole the progress achieved by Agricultural Demonstrators and Revenue Inspectors was 89·8 per cent and 49·1 per cent respectively. Though the achievement of the Revenue Inspectors was slightly better than during the last year in as much as 49 per cent of the experiments allotted to them were considered for analysis as against 43 per cent during the previous year, the progress was far from satisfactory. The poor progress on the part of the Revenue Inspectors was due mainly to the fact that they were unable to bestow sufficient attention in view of their multifarious duties and in certain cases their not evincing keen interest in the work. More often the officers in charge of the work could not contact the Revenue Inspectors at the time of their visit to the villages due to the non-availability of the Revenue Inspectors. Effective supervision by the Special District Agricultural Officers and chances of their giving personal instructions to the Revenue Inspectors were thus rendered almost impossible.

5. *Results of experiments conducted.*—The results of the crop-cutting experiments conducted during 1953–54 in the Residuary Madras State are summarized below :—

Category I—Paddy.—As in the previous year, the crop-cutting experiments on paddy were conducted during the three periods covering the crop harvested, from July to October, November to March and April to June respectively. The total number of experiments planned on Paddy first crop was 300, out of which only 278 experiments were considered for analysis. One thousand one hundred and twenty-eight experiments were planned on the 2nd crop paddy but only the results of 1,037 experiments were analysed. The number of experiments planned for the third period crop was 48, the number considered for analysis was only 38. Thus in all the three periods taken together, the number of experiments considered for analysis was 1,353 as against 1,476 planned in 738 villages at the rate of two experiments per village. The per centage of the number of experiments considered for analysis to the number of experiments planned works out to 91·7. During the last fasli 2,574 experiments were planned, for the undivided Madras State, 2,293 experiments were considered for analysis and the percentage of the latter to the former in respect of paddy crop combined for all the three periods was 89.

The results of the statistical analysis for the first second and third period crops are given in appendices 19, 20 and 21. The average yield of rice for the State as a whole in respect of first second and third crops, works out to 992·81 lb. per acre, 1,008·18 lb per acre and 1,206·54 lb per. acre, respectively, the respective percentage of standard error was 4·59, 2·16 and 8·14. The corresponding figures of average yield during the previous year relating to the Composite Madras State are 1,002·1 lb. per acre, 1,021·9 lb. per acre and 732·07 lb. per acre the respective percentage of standard error being 3·5, 2·7 and 11·34.

Category II—Assessment of additional production due to Grow More Food aids.—Unlike in the previous years, crop-cutting experiments were not conducted during the fasli 1363 with the Grow More Food Aids, on all the three crops of paddy. The experiments were confined only to the main period crop and the second aid, viz., green manure was limited to Sesbania only. The 252 experiments planned with the three aids were distributed as shown below· Improved seed (88), Sesbania (73) and Ammonium Sulphate (91) and the number of experiments under each of the three aids completed satisfactorily and considered for analysis was 66,55 and 78, respectively. These total up to 199 or 79 per cent of the experiments planned. The statistical analysis of the results relating to these experiments is summarized in appendix. It will be seen from the appendix that the rate of response, i.e., the additional yields of rice in lb. per acre due to the application of the three aids were as follows :—

Aid.	Increase in lb. per acre of rice.
Improved seed	193
Sesbania	180
Ammonium sulphate	251

Category III—Millets.—During the year under review 3,266 experiments on millets were planned for the Residuary (Madras) State, and 1,602 were completed successfully, i.e., about 49·1 per cent. The corresponding figures for the previous year were 6,788, 2,918 and 43 per cent respectively for the Composite Madras State. The particulars of the number of experiments planned and the number of experiments completed and considered for analysis under each category of the millets are given below :—

Category of experiments.	Number of experiments. Planned.	Completed and considered for analysis.	Percentage of the number completed and taken for analysis to the total planned.
Irrigated cumbu	200	94	47·0
Unirrigated cumbu	800	355	44·4
Irrigated ragi—			
I Crop	503	289	56·9
II Crop	212*	114	53 8
Unirrigated ragi	460	214	46·5
Irrigated cholam	394	205	52·0
Unirrigated cholam	692	331	47·8
	3,266	1,602	49·1

* Twenty-six experiments were shifted from the first period to second period.

The results of the analysis for each category of experiment under millets are given in appendices.

The average yield, the percentage of standard error and the estimated production for the State in respect of the experiments under each Millet crop are shown below :—

(i) *Irrigated cumbu.*—The estimated average yield per acre worked out to 620·81 lb per acre for the State and the percentage standard error worked out to 13·24. The estimated production for the State was 41,900 tons.

(ii) *Unirrigated cumbu.*—The estimated average yield for the State was 360·56 lb. per acre and the percentage sampling error of the estimate was 5·46. The estimated total production for the State worked out to 199,700 tons.

(iii) *Irrigated ragi first crop.*—The estimated average yield and the percentage sampling error for the State worked out to 998·88 lb. per acre and 3·71 respectively. The estimated total production was 134,600 tons for the State.

(iv) *Irrigated ragi second crop.*—The estimated average yield for the State was 1235·38 lb. per acre, the percentage sampling error was 6·20. The estimated total production worked out to 70,000 tons for the State.

(v) *Unirrigated ragi.*—The average yield for the State was estimated at 607·88 lb. per acre and the percentage standard error was 6·22. The estimated production worked out to 1,28,800 tons.

(vi) *Irrigated cholam.*—The average yield for the State was estimated at 1,100·13 lb. per acre and the percentage standard error was 5·28. The estimated production worked out to 190,200 tons.

(vii) *Unirrigated cholam.*—The average yield for the State was estimated at 397·13 lb. per acre and the percentage standard error was 6·41. The estimated production worked out to 223,600 tons.

XII. WYNAAD COLONIZATION SCHEME.

In the Wynaad Colonization Scheme research work in the Agricultural Research Station, Ambalavayal and extension among the colonists were both pursued.

Research—(a) Progress of work during the year—Paddy.—The trial of eight different varieties strains and types of paddy was concluded. Variety Mankora was found suitable for extensive cultivation in Wynaad.

Two years of trial of twenty two types indicated that the Ceylon varieties Channellu and Maranellu were better than the rest.

The Chinese types under co-operative trials indicated that three of them were high yielding with short durations in the first cropping season.

The cultures of local varieties under multiplication recorded high yields and were awaiting to be released as strains. Selection work in the fine variety Jeerakasala has reached the stage when 20 of its cultures representing high yielding and other outstanding characters could be further tried for confirmatory tests.

Progress of work on the raising of a second crop of paddy successfully under limited irrigation from December to April was satisfactory. Transplanted paddy crop recorded higher yield over the broadcast sown crop in almost all varieties under test.

Fruits.—Cultural and manurial trials on mandarin orange indicated that the two treatments 'manuring and mulching' and 'mulching' contributed for better growth conditions of the plants.

Observations on the different rootstocks and budlings and seedlings were in progress.

A small scale fruit preservation unit was set up.

(*b*) *Results achieved in research—Paddy.*—Three high yielding introduced varieties, viz., Chennellu and Maranellu of Ceylon and Mankora from Kenya were selected for multiplication and distribution.

Cultures of four local varieties have reached the final stage of release as strains.

Cultures of Jeerakasala have recorded very high yields of over 4,000 lb. the best being 4,879 lb. recorded by culture No. 190.

A second crop of paddy was successfully raised with medium and short duration varieties.

Fruits.—Cultural and manurial treatments in mandarin orange have indicated the possibility of inducing early bearing and tolerance to drought to an extent.

Preliminary laboratory tests in fruits preservation work has indicated great scope for large scale work in this direction.

(*c*) *Economic gains to cultivators.*—Cultures of local variety of paddy finally found suitable for cultivation in the tract during the first cropping season have recorded yields 10 to 15 per cent more than the local bulk varieties contributing to an increase in income by 10 to 15 per cent.

The high yielding selection from Jeerakasala has apart from increasing the yield by 15 to 20 per cent added to the net income by another ten per cent in money value.

With the aid of a fruit preservation unit, the surplus produce of the major fruit crops could be usefully converted into marketable product with material gain.

Extension work.—Propaganda among the colonists was carried for cultivation of crops in improved lines, green manuring, composting, soil conservation application of chemical manures, culture of perennial crops as coffee, cacao and fruits plants and vegetable.

The following are the achievements :—

Ploughing with tractors	97·25 acres.
Levelling	64·50 ,,
Harrowing	56·50 ,,
Contour bunding	2 0·00 ,,
Contour planting	630·00 ,,
Paddy second crop	300·00 ,,
Green manuring	450·00 ,,
Green leaf	1,000 ,,
Perennial crops	38,177 plants (Nos).
Composts	330 tons.
Chemical manures	10 ,,
Vegetables	23 lb.
Pesticides	749 ,,

XIII. PROPAGANDA, DEMONSTRATION AND PUBLICITY (EXTENSION WORK).

Propaganda.—The Agricultural Extension staff concentrated their efforts on propaganda on the several schemes of the intensive food production plan, cotton extension and sugarcane development included in the Five-Year Plan. Special emphasis was laid on modified Japanese method of paddy

cultivation, raising Sesbania Speciosa in paddy fields along bunds, sinking filter point tube wells, intensive manuring of paddy with fertilisers, cultivation of cotton in rice fallows, crop competitions in paddy and Sugarcane, raising village paddy seed farms, formation of Agricultural Associations in villages adoption of improved methods in Sugarcane and cotton. The extension staff toured the villages frequently held meetings of ryots and constantly conducted demonstrations with improved implements, exhibits and posters.

Demonstration plots.—In all 10,269 propaganda meetings were held and 5,885 demonstration and trial plots were laid out in ryots' fields to bring home to the cultivators the use of improved seeds, manures and better cultural practices in the Residuary State.

Besides 12,669 plots were arranged under the Modified Japanese Method of cultivation. The target fixed by the Government in G.O. Ms. No. 352, Agricultural, dated the 8th February 1954 was one demonstration plot for each village and this is being pursued.

Agricultural associations.—Agricultural associations were continued to be organized. So far 16,000 Agricultural associations were formed against a total of 21,000 villages in the residuary state and 13,500 last year. New associations were formed in villages without them and membership and functioning were sought to be improved. All Agricultural improvements were put across through the members of these associations. Modified Japanese method of paddy cultivation, Sesbania as the pure crop and border crop in paddy, village paddy seed farms, composting waste vegetable matter, tree planting, Grow More Food Journals were some of the items popularised through these associations.

Publicity.—Publicity on agricultural topics was given through the Grow More Food Journals published monthly in the three regional journals Tamil, Malayalam and Kannada after the separation of the Andhra State. The present rate of subscription is Rs. 2–4–0 per annum. Besides the monthly issues an annual issue was also published. To make the Journal more attractive a new set up was given. The following is the strength of the subscribers at the end of the year under report :—

	Nos.
Mazhichelvam (Tamil)	21,995
Naveenakarshakan (Malayalam)	3,471
Krishikarabandhu (Kannada)	1,339

The annual Villagers' Calendar and Guide for the year 1954 was published in the three regional languages. The work of translating the popular booklets published in English into regional languages was taken up. Leaflets on subjects to topical interest were published as cotton in rice fallows, control of pests and diseases, etc. Besides, 23 articles were sent for publication in the *Agricultural News Letter* on important subjects relating to cotton, groundnuts, fodder grasses, cumbu hybrids and control of diseases and rodents.

Radio for publicity was also pressed with Service and the following talks on subjects of topical interest were given from the All-India Radio Stations in the State :—

	Date of broadcast.	Subject of the talk.	Language and station from where broadcast.
1	29th November 1953.	A variety programme	In Tamil from All-India Radio Tiruchirappalli.
2	5th December 1953 ..	Increase of Food production with hybrid bajra (cumbu).	Do.
3	15th January 1954 ..	'On sugarcane'	Do.

	Date of broadcast.	Subject of talk.	Language and station from where broadcast.
4	23rd January 1954 ..	'Sesbania as green manure' ..	In Tamil from All-India Radio, Tiruchirappalli.
5	8th March 1954 ..	Advance in Agricultural Research in Madras State.	In Malayalam from All-India Radio, Madras.
6	11th March 1954 ..	Fruit Research in South India ..	Tamil from All-India Radio, Tiruchirappalli.
7	12th March 1954 ..	Advances in Agricultural Research in Madras State.	In Kannada from All-India Radio, Madras.
8	11th April 1954 ..	Demand and supply of coconuts ..	Tamil from All-India Radio, Madras.
9	23rd April 1954 ..	'Five-Year Plan' Agricultural Education.	In Kannada from All-India Radio, Madras.

Besides 57 articles of important improvements of crops, were sent to the Director of Publicity, for release in the Radio for information to the public as required in Government Memorandum No. 43367-K/53-7, Food and Agriculture, dated the 13th October 1953, on such subjects as green manuring, groundnut varieties, pests of paddy, manufacture of compost, fodder grasses and cultivation of rice, cotton, fruits and root crops.

Agricultural Information Committee.—In G.O. No. 3186, Agriculture K-53/12, dated 2nd July 1953, Government ordered that agricultural information committee at headquarters be formed with the Director of Agriculture as Chairman and the Director of Animal Husbandry the Director of Publicity and the Station Director All-India Radio and an Agriculturist, Sri C. G. Guruswami Naidu, as members. The object of the Committee is among other things to organize and formulate information and publicity for such items as Japanese method of cultivation and collection, preparation and distribution of literature for agricultural extension work and conducting campaigns. A meeting of the Committee was held on 15th April 1954. The meeting recommended the growing of perennial legumes for the supply of fodder, and that wide publicity should be given to the crop competitions through the Director of Publicity. The Committee also recommended film units as effective propaganda for agriculture and proposals for this were submitted to Government.

The Government also ordered that a counter should be opened at the Agricultural Seeds Depot in Mount Road, Madras City, for giving information on agricultural matters and popularize agricultural publications. This was opened on 17th March 1954, and 947 publications, booklets and bulletins were sold to the public at a value of Rs. 219–4–0 and the demand for such books is increasing.

The Government of Madras also accepted the offer of the Indian Council of Agricultural Research of a Multilitho equipment for expanding printing facilities.

Exhibition.—As an aid to propaganda, exhibitions were organized in connection with all important fairs, festivals and during social, religious or political conferences. On such occasions besides putting up exhibits and posters, demonstrations with improved implements and magic lantern shows were arranged. In all 136 exhibitions, big and small, were organized.

Crops—(*a*) *Paddy.*—Paddy strains evolved from the Agricultural Research and Breeding Stations give at least 10 per cent increased yields over locally cultivated varieties. So multiplication and distribution of Paddy strains formed the main item of work of the Extension staff. The special seed development staff continued to look after the primary seed farms and helped to check

the purity and viability of seeds produced in secondary seed farms. Complaints about the quality of seeds distributed by the department have gone down. The following are the particulars of primary and secondary seed farms organized and seeds procured from them :—

	Acreage.	Quantity of seeds procured.
Primary Seed Farm	2,738	1,091 tons.
Secondary Seed Farm	6,659	

A total quantity of 1,395 tons of improved paddy seeds was distributed during the period under report. The area so far covered by improved strains of paddy was 2·57 million acres or 44 per cent of the area in the Residuary State.

(*b*) *Millets.*—Improved millets, seeds were multiplied and procured the seed farms for distribution.

	Acreage.	Quantity of seeds procured.
Primary seed farms	911	17½ tons.
Secondary seed farms	1,369	

A total quantity of 47 tons of improved millets seeds distributed during the period reported on. The area covered by millets so far was 7·9 lakhs of acres or 18 per cent of the millet area.

(*c*) *Pulses.*—The following are the particulars of Pulses seed farms organized and seeds procured :—

	Acreage.	Quantity of seeds procured.
Primary seed farms	14	200 lb.
Secondary seed farms	13	

A total quantity of 210 lb. of improved pulses seeds were distributed.

Cotton.—Seeds of improved strains were multiplied in two schemes in Coimbatore and Tirunelveli district with special staff sanctioned for the purpose. The following are the particulars of seed farm area and quantities of seeds procured for distribution :—

Serial number and name of variety.	Quantity of seeds distributed for sowing in 1953-54.	Target of seeds to be procured during 1953-54.	Actual procurement.	Target of seed farm area.	Actual seed farm area.
	LB.	BAGS.		ACS.	ACS.
1 Co. 2	12,575	1,500	113 bags (100 lb. each) up to 30th June 1954).	500	466
2 K. 5	117,600	10,000	2,889 bags up to 30th July 1954 procurement in progress.	10,000	9,854
3 MU-1 (Central districts).	109,715	16,500	3,781 bags up to 30th June 1954 procurement in progress.	5,500	5,065
4 MU-1 and MU-2 (southern districts).	84,464 26,895	12,600	Crop in the field ..	4,000	4,049
5 K. 2	558,600	30,000	9,725 bags up to 30th June 1954.	30,000	30,000

Besides seeds of P. 216 F was purchased from Punjab and in Tanjore districts for distribution in Tanjore and other areas for raising cotton in rice fallows.

A total quantity 1,088 tons of improved seeds sufficient to cover 117,183 acres was distributed. The area covered by improved strains of cotton in the Residuary State so far was 5·34 lakhs of acres or 63 per cent of the total cotton area.

Oil seeds.—After the partition of the Andhra State, groundnuts and castors were multiplied in three zonal seed farms and coconut seedlings were raised in five centres only. The following improved seeds and seedlings were distributed :—

		LB.
Groundnut	Pods ..	93,080
	Kernels ..	1,140
Castor		1,500
Gingelly		1,900
		NOS.
Coconut seedlings		52,263

The area under improved strains of oil seeds was 3·3 lakhs of acres in groundnut or 17·5 per cent and 4·2 lakhs of acres in gingelly or 15 per cent and 2,200 acres or 6 per cent in castor.

Fruits.—Choice grafts, budded plants, layers, seedlings and cuttings of fruit plants were raised in large numbers in Government fruit nurseries and fruit centres and made available to the public. Special drive for distribution was organized whenever stocks accumulated in nurseries. The following are the particulars of fruit and vegetable plants and seeds distributed :—

	Number of plants.	Quantity of seeds.
Pomological Station, Coonoor	18,699	36
Kallar and Burliar Stations	13,095	837
College Orchards, Coimbatore	21,283	350
Fruit Centres at Wynaad, Taliparamba ..	52,607	5,385
Model Orchards *cum* Nurseries at Mangalore, Periakulam and Thimmapuram ..	3,731	210
Government Botanic Gardens, Sim's Park, Coonoor	118,362	66
Pepper Scheme, Tuber Scheme and Cashew Research Scheme	2,385	3,227
Total ..	230,162	10,111

So far about 2,100 acres of mango have been cultivated with improved varieties and 4,200 acres under Banana. The area under citrus plants has been increased by 21,600 acres. Extension work has also been intensified in introducing improved cultural and orchard practices and the area so far covered was 5,300 acres in citrus fruits and 17,000 acres in bananas.

Vegetables.—The production of vegetables was encouraged by distribution of vegetable seeds produced in the Agricultural Research Stations and from reputed vegetable seedsmen. The special staff to encourage city production of vegetables continued to function in the Madras City. They visited 3,663 bungalows and distributed 549 lb. of vegetable seeds, 18,500 vegetable

seedlings, 603 fruit plants and 187 coconut seedlings. Besides the staff supplied manures and fertilizers and demonstrated the methods of cultivation, control of pest and diseases and supplied popular leaflets and booklets on vegetable gardening. They tackled about 215 acres which can be estimated to produce 645 tons of fresh vegetables. In the districts 1,342 lb. of vegetable seeds were sold to the public.

Expansion of choice varieties of perennial vegetables.—With a view to increase the permanent output of vegetables, for protective and nutritional purposes, the Agricultural Department is having a special campaign to have them expanded to selected villages and holdings every year. During the year, 4,094 holdings in Papaya, 3,778 in curry leaf, 3,303 in Malta Lemons and 11,027 holdings in drumsticks were covered. The Ceylon Spinack (Seemai Keerai) is being popularized in all districts, as it is very much relished.

Sugarcane—Extension work.—In the Nellikuppam zone the Special Sugarcane development staff attended to the spread of Co. 527 and Co. 449, manuring with optimum quantity of concentrated manures at the optimum time, use of green manures and control of Smut and Sugarcane pests.

In the Kulittalai zone, the Special development staff attended to the spread of Co. 449 and Co. 467 which were found to be practically free from smut and high yielding with good juice quality. 'Use of labour saving implements' manures to the optimum extent and greenmanures were demonstrated in demonstration plots.

The Agricultural Pests and Diseases Act was in operation in the Pugalur Factory area for the second year in succession. Control measures were enforced and were carried out successfully. Sugarcane fields were inspected and certified as disease free for use as seed and over 1,200 acres were planted for such certified crops.

The following are the important items of sugarcane development work carried out during the period under report :—

Sugarcane Development Work.

		ACS.
1	Area ploughed with improved ploughs	4,498
2	Area worked with ridge ploughs	2,766
3	Area brought under optimum spacing	6,220
4	Area planted with selected seed materials	5,870
5	Area planted with optimum seed rate	5,526
6	Area brought under green manure	1,768
7	Area manured with green leaf	3,180
8	Area manured with optimum manuring	8,152
9	Area brought under proper irrigation	3,322
10	Area brought under proper drainage	3,031
11	Area harvested at the time of optimum maturity	3,184
12	Area from which Smut disease was eradicated	7,391
13	Area in which sugarcane borers were controlled	4,705
14	Demonstrations in the preparation of better quality jaggery (numbers).	2,115

The area covered by improved strains of sugarcane so far was 113,050 or 95 per cent of the area in the Residuary State.

Manures—Cattle manures.—Cattle manure is very important for manuring cultivated fields for maintaining and augmenting crop production. But proper care is not taken to prepare and conserve the available supplied to the maximum. So sustained propaganda is kept up for proper conservation of this important manure source and the following are the achievements :—

		NOS.
(1)	Manure pits newly opened	23,533
(2)	Manure pits renovated	27,857
(3)	Byre system for conservation of urine	670
(4)	Dry earth system	11,780
(5)	Loose box system	1,614

Composts.—As sufficient cattle manure is not available, propaganda for conversion of all waste vegetable matter available in villages into useful composts through the simple process of composting in pits, was done and in all 66,610 tons of rural composts are estimated to have been prepared in all the districts by the extension staff.

Propaganda for the use of urban composts prepared and sold by municipalities and panchayats was done and the prejudice against the use of these is breaking down gradually. A quantity 164,590 tons of compost was distributed from municipalities and panchayats.

Green manures.—To supplement cattle manure and composts as manure for crops intense propaganda for cultivation of green manure crops was done. Sesbania as a border crop and pure crop for paddy was attempted on a large scale. Over 905,158 acres of paddy land was brought under this plant as against 202,088 acres last year. Other green manure crops as daincha, sunnhemp, Kolingi and indigo were encouraged wherever found suitable.

Growing green manure crop between rows of sugarcane in early stages was also adopted.

Planting of perennial green manure yielding plants as Gliricidia, Pungam, Ipomea Carnea, Malaipoovarasu, in all waste places was encouraged and large quantities of seed material required were made available.

Extension of useful plants.—Besides 30 million plants of *Gliricidia* established in wet and garden lands and *Indigoferra Teysmaii*, several useful plants are being expanded by distribution to ryots. Seeds of Calapagonium are collected and distributed particularly in South Kanara, Malabar districts and in the higher elevations of Coimbatore to serve as a useful cover crop. Besides, seeds of *Crotalaria anagroides* were distributed to several districts for trial as a green leaf crop.

In order to expand the cultivation of pepper on a wide scale, propaganda was done to have it grown and trailed in coconut and arecanut gardens in Malabar and South Kanara districts. A number of ryots have taken to this practice. Besides a species of *Euphorbia* which has been found useful as a hedge plant in Salem is being extended to other districts. About 200 lb. of seeds of *Denoli elata* have been collected and these have been distributed in the southern districts for extension in ryots holdings near fences and borders of fields. A large number of cuttings of *Hibiscus Tilieceous* (Malaipoovarasu) have been established in a number of holdings in the southern districts.

Prosopis Juliflora has been extended on a large scale as a fence crop and as border crop on road and rail margins to serve for fuel soil conservation and as a useful hedge plant.

Fertilizers.—As a supplement to bulky organic manures fertilizers were advocated for application to crops as paddy, sugarcane and cotton. Supply of large quantities to paddy was done through a special scheme small cultivators were given loans for purchasing the chemical fertilizers as ammonium sulphate and superphosphate. The following quantities of fertilizers were distributed through the department and through co-operative societies and other approved agencies :—

	TONS.
Ammonium sulphate	44,330
Superphosphate	1,374

Fodder crops.—Propaganda was done for cultivation of fodder crops to supplement natural grazing available for cattle. Seeds of fodder crops as cholam, pillipesara, etc., and slips of guinae grass and Napier grass were made available to interested ryots. About 4 tons of fodder seeds and 425,055 slips of grasses were distributed.

Crop competition.—The crop competitions have become very popular with the agriculturists.

Crop yield competition fortnight.—The crop yield competition fortnight was celebrated in all districts from 1st June to 14th June 1954. Prizes to winners of crop yield competitions were distributed by high officials and personages. Meetings were held and the object of the competitions were explained to the ryots. Intensive propaganda was done to enlist a large number of competitors. During the fortnight 1,897 competitors were enlisted.

Crop competition—Review of progress.—During the year 1953–54 crop competitions were held in all the districts in the Madras Residuary State.

The competition covered all varieties of paddy grown under any system of cultivation and prizes were awarded from the Firka level onwards.

The crop competition was also organized in respect of the crops cholam, cumbu and potato in the following districts :—

Cholam and cumbu—Coimbatore district.

Potatoes—The Nilgiris.

Government have since revised the award of prizes at the firka, taluk, district and State levels as follows, in their G.O. Ms. No. 75, Agriculture (Food Production), dated the 12th March 1954 :—

1 State prize	A gold medal worth Rs. 300 (real gold) plus certificate.
2 Regional prizes	(i) Real gold medal worth Rs. 100 plus (ii) Cash of Rs. 100 plus (iii) Certificate.
3 District prizes	(i) Real silver medal worth Rs. 50 plus (ii) Certificate.
4 Taluk prizes	(i) Real silver medal worth Rs. 30 plus (ii) Certificate.
5 Firka prizes	(i) Rs. 20 in cash plus (ii) Certificate.

The prizes are being awarded to the prize winners at different levels.

The total number of competitors who entered for the competition during the year and the area brought under competition in the Madras Residuary State are given below :—

Name of the crop.	Number of competitions enlisted.	Area brought under competition. ACS.
Paddy	11,841	4,914
Potatoes	313	156
Cholam	373	186
Cumbu	109	54
Total ..	12,636	5,310

The highest yields recorded in the crop competitions this year were as follows :—

	Highest yield lb. per acre.
Paddy	8,207
Cholam	5,150
Cumbu	3,672
Potatoes	43,580

Loans.—The following amounts were issued as loans for purchase of seed and manure, implements and chemical fertilizers under intensive manure scheme :—

	RS. IN LAKHS.
For seeds and manures	9·26
For implements	0·10
For chemical manures	40·00

XIV. HILL TRIBES UPLIFT SCHEMES.

Toda Welfare Scheme.—This scheme for the uplift of Todas in Nilgiris was in operation for three years and is continued with expanded staff. A sum of Rs. 18,070 was advanced as loan to 80 Todas in the form of seed potatoes (250 bags) and manure mixtures (250 bags) to cultivate 32 acres. The whole amount was recovered at harvest. Besides creating an agricultural bias among the Todas they were also taught improved methods of agriculture and to settle down in a place instead of moving from place to place.

XV. VANAMAHOTSAVA OR NATIONAL TREE PLANTING WEEK.

The following are the particulars of seeds, seedlings and cuttings of useful plant and trees distributed during Vanamahotsava Celebrations in July 1954 :—

Fruit tree seedlings	262,313	Nos.
Cuttings of economic importance	249,433	,,
Other seedlings of economic importance	1,100,863	,,
Seeds	5,029	lb.

XVI. AGRICULTURAL MARKETING.

Market surveys.—Work regarding market surveys continued side by side with the development programme. A report on the marketing of peas,

french beans and tomatoes in the State was prepared and sent to the Agricultural Marketing Adviser to the Government of India, New Delhi. Further information was collected on the marketing of tapioca, lac, wool and hair, animal fats and by-products and was also sent to the Agricultural Marketing Adviser. The materials for the Market Survey reports on soil seeds, cereals, pulses and spices were made up to date.

Detailed information on the production and marketing of kapok and myrobolans was collected to study the possibilities of grading in response to a questionnaire on the subject from the Agricultural Marketing Adviser to the Government of India, New Delhi.

Movement data on major commodities from all important railway stations were collected and compiled as usual. Necessary help was rendered to the Directorate of Marketing and Inspection for its officers to visit the cardamom and cashewnut production centres for studying in detail the existing classification and trade practices for drawing up suitable grade specifications for those commodities.

Grading of commodities—Ghee.—There were four ghee grading stations two at Tiruppur, one at Coimbatore and another at Madurai. Five authorized packers operated from these four stations inclusive of a newly authorized packer Sri T. M. Angappa Chettiar, Karugayam (Coimbatore district), who gets his ghee graded and packed from the grading station at Madurai jointly with the other packer there. The total quantity of ghee graded from 1st October 1953 to 30th June 1954 was 6,301 railway maunds valued at Rs. 10,41,750. The graded ghee had consumer preference only in North Indian markets at Calcutta and Delhi where ghee is used mostly for cooking (i.e., preparations of dishes) and very little direct use is made on table in serving with rice as is in vogue in the South. In South India, ghee twice boiled as in the Agmark quality and underboiled to avoid caramelisations is not popular due to the characteristic flavour, to which the South Indian palate is very partial, being absent.

Eggs.—Six authorized packers were newly enlisted besides six of them already engaged in grading of eggs in the State, in an endeavour to create and push up a consumer demand and preference to pre-tested quality in the retail sales. A total of 532,945 eggs valued at Rs. 68,171 were graded in the period under report. During the latter part of the year there was a decline in the output of graded eggs due to the set-back brought about by the City hospitals deciding on the placing of contracts for ungraded eggs. The question of Government institutions like hospitals continuing to show preference to graded eggs and other commodities marketed under Agmark has been taken up with Government. In the meantime it is also necessary to build up a positive consumer preference to Agmark products and special propaganda on this behalf has been taken on hand.

Fruits.—One dealer at Vellore (North Arcot district) was authorized to pack Neelam and Bangalora mangoes under ' Agmark ' this year. Actual work could not however be started within the season as supply of labels, seals and other equipment could not be received in time.

Potato.—There was no grading of potatoes during the period from 1st October 1953 to 30th June 1954 due to the fall in prices of potatoes in North Indian markets. Efforts are being made to organize and step up output of Agmark potatoes by arranging supply to Government and quasi-Government institutions, the India Coffee House and the Railway grain shops.

Rice.—Thirteen Certificates of Authorization for grading rice under Agmark were issued since January 1954 but the authorized packers have not yet started grading due to the interplay of many economic factors like the paucity of gradable rice, lack of demand for graded quality and preference to the cheaper quality of damp rice mill orders for the delivery of rice out of levy stocks on Government account and such other factors. There is need for well sustained work in popularizing Agmark rice which is also arduous. The Marketing Section is tackling this in a determined manner and hopes to succeed next year.

Other produce.—As a result of some canvassing for the grading of cane jaggery three Certificates of Authorization were issued to traders in Tiruchirappalli district and one in Coimbatore district. The authorized packers have not yet started grading as the jaggery making season has not commenced after the issue of Certificates of Authorization.

The grading of tobacco continued to be done with the special staff under the direct control of the Directorate of Marketing and Inspection and the State Marketing Officer is concerned only with the recommending applications for Certificate of Authorization. Seven authorized packers have been issued Certificates of Authorization in the year. One Cerificate of Authorization has been recommended for the grading of bristles.

The total value of Agmark products in Madras excluding tobacco, sunnhemp, bristles, etc., was Rs. 11·09 lakhs during the period from 1st October 1953 to 30th June 1954 (vide Appendix).

Regulated markets.—Regulation of markets had been attempted only in respect of six crops, viz., cotton, tobacco, groundnut, gingelly, coconuts and arecanuts out of seven, including potato which are declared as commercial crops under the Madras Commercial Crops Markets Act, 1933. There are seven market committees functioning in Madras State after separation of Andhra State. The North Arcot Market Committee commenced functioning from 12th October 1953 in the year under report. The administration of these committees was controlled and guided by the Director of Agriculture, Madras, through the Marketing Section. The benefits of the regulated markets are extended under this Act to 2,517,672 acres out of 3,986,403 acres under these six commercial crops. Details are furnished in the table below :—

Names of crops.	Total area in the State	Area benefited by the Act.	Percentage of area benefited.	Districts covered.
(1)	(2)	(3)	(4)	(5)
	ACS.	ACS.		
Cotton	881,050	690,791	78·4	Coimbatore, Tirunelvelli, Ramanathapuram and South Arcot.
Groundnut	1,938,172	1,184,152	61	South Arcot, North Arcot, Coimbatore and Ramanathapuram.
Gingelly	438,457	41,729	9·5	South Arcot.
Coconut	559,367	455,709	81·5	Malabar and South Kanara.
Areeannt	114,727	111,682	97·3	Do.
Tobacco	54,690	33,609	61·5	Coimbatore.
Total ..	3,986,463	2,517,672		

The enforcement of market regulations under the Madras Commercial Crops Markets Act became very complicated as certain sections of the trade attempted—and are still persisting in trying —to sabotage any kind of regulation in buying and selling. A challenge to the validity of the Act through

writ petitions in the High Court from groups of traders in Ramanathapuram, Malabar, Coimbatore and Tirunelveli districts resulted in the Act being held valid subject only to two exceptions as follows :—

(i) Licences under section 5 of the Act which provides for persons setting up or using or continuing to use places for purposes of buying, selling, weighing, storage, processing, etc., taking out licences cannot be denied at the discretion of the Licensing Authority but should be issued to every one applying for them.

(ii) Restraining persons from trading in commercial crops, except after registration in the Market Committee, shall not be enforceable.

While this decision has been accepted by the trade in general, two groups of merchants in Tirunelveli and Ramanathapuram districts are challenging it by an appeal in the Supreme Court.

The District Court at Coimbatore has held that fees payable to the Market Committees under section 11 of the Act on commercial crops bought and sold in its area would amount to a tax which the market committees are not entitled to levy and that the section authorizing the levy should therefore be held void. This pronouncement is being taken in appeal to the High Court.

Apart from these major knocks on the enforcement of market regulations under the Act one of the market committees, viz., the South Kanara Market Committee has also been disabled from functioning based on the finding of the District Court that its legal constitution was faulty because of technical flaws in procedural details as to notification at the time the committee was set up.

The basis for the collection of fees under section 11 of the Act came in also for dispute because of a flaw in the by-law framed by the Coimbatore Market Committee and even after a cempromise order by the High Court the dispute remained pending till the end of the year.

The Government have under consideration a few amendments to the Madras Commercial Crops Markets Act and rules based on the experinence gained and decisions in the High Court and District Courts. Apart from these the following amendments were made to the Act and rules :—

(i) *Section 5-B was introduced in the Act.*—Defining the jurisdiction of Bellary Market Committee after the formation of the Andhra State.

(ii) *Rule* 79.—Every buyer and seller and every licensee shall submit to the Market Committee return or returns relating to his transactions in the notified area as may be prescribed with safeguards as to secrecy of data thus furnished.

(iii) *Rule* 65.—Enhancement of maximum limits prescribed for execution of work, purchase of stores and cost of printing, etc.

(iv) *Rule* 3.—Powers of the appointment sub-committees of Market Committees—ratifiation of orders by market committees.

Of the seven market committees in the State five have had to face difficulties in the manner outlined above. To that extent the efficiency of their functioning became impaired. Work in three committees, viz., Ramanathapuram Market Committee, Tirunelvelli Market Committee and South Kanara Market Committee came to a standstill. Work in the Coimbatore Market Committee stood partially restrained. Good work was turned out by the South Arcot Market Committee while the Market Committees of North Arcot and Malabar were only getting into pace.

The South Arcot Market Committee had its full complement of eight regulated markets of which however two are gradually waning into inactivity due to lack of patronage by buyers and consequent paucity of arrivals of produce. The old market at Tiruppur of the Coimbatore Market Committee continued to function and two markets at Gobichettipalayam and Pollachi were opened by the Committee. The North Arcot Market Committee also opened two markets at Vellore and Tiruvannamalai while the Tirunelveli Market Committee opened a market at Kovilpatti. All these five new markets opened by the three market committees in the course of the year are yet to attract produce and function effectively. The Malabar Market Committee has been attempting to locate suitable places for setting up its markets and negotiations in this behalf did not fructify even during the year under report.

The eight regulated markets in South Arcot together accounted for a transaction of 606,388 bags (177 lb. each) of groundnut kernels out of 628,219 bags marketed in all the eight cenres. The arrivals in these markets were also voluntary. All transactions were put through under chit-tender auction by the market committee which secured for the sellers the best price available. The extra income earned by sellers in this way for the year 1953 has been estimated as Rs. 5·92 lakhs. Of the produce thus sold in the eight markets 91·5 per cent were marketed direct by the growers themselves without any other market intermediary.

More than 77·7 per cent of the produce was taken off by oil mill interests direct from the sellers. These markets of South Arcot Market Committee have thus ensured one of the most cherished requirements in better marketing, viz., putting growers in direct contact with consumers and eliminating unnecessary middlemen costs. Similarly in the case of gingelly these eight markets accounted for transactions in 2,783 bags (2 maunds each) out of 4,530 bags assembled at the centres. In the case of cotton, however, which is important in only two markets the committee's markets could account for only 20 pothies (280 lb. each) out of 8,650 pothies assembled at the centres.

Marketing of cotton outside Coimbatore Market Committee's market at the assembling centre of Tiruppur is statutorily prohibited. All transactions in cotton at Tiruppur were thus centred in the regulated market there. A total quantity of 11,933 candies of lint, 100,110 pothies of kapas, totalling 43,468 candies in all in terms of lint were transacted during the period 1st October 1953 to 30th June 1954 at Tiruppur while 1,107 pothies of kapas were received in Pollachi. The markets of the North Arcot Matket Committee for Groundnut at Vellore and Tiruvannamalai accounted for transactions in three bags of groundnut pods and 238 bags of kernels.

Co-operative marketing.—The marketing staff at headquarters and at the regional centres contacted important co-operative societies and rendered possible help in better marketing of agricultural produce. Among the co-operative societies that received attention were the Katpadi Egg Marketing Society, Tiruvannamalai Co-operative Marketing Society, The Nilgiris Marketing Society, the Ponnani Arecanut Processing and Marketing Society and the Tanjore Co-operative Marketing Federation all of them engaged in marketing of agricultural produce. Plans and schemes were examined and commented on which included proposals relating to hand-pounded rice, jaggery making, curing tobacco, processing tapioca stratch, flour and globules, marketing eggs under Agmark, etc. The State Marketing Officer functioned as an Ex-Officio Director in the Provincial Co-operative Marketing Society till its liquidation at the end of the year under report.

Market legislation.—Market legislation under the Madras Commercial Crops Markets Act have been dealt with under regulated markets. Introduction of Grading and Marking Rules for bristles came into force on April 1954.

Warehousing and storage.—Efforts are being made to convert some of the existing godowns of the co-operative sale societies into licenced warehouses under the Madras Warehouses Act. The Koothanoor Marketing Society (Tanjore district) and the Karur Co-operative Marketing Society have agreed to take up warehousing work. The Tiruvarur Co-operative Marketing Federation and the co-operative marketing societies at Gobichettipalayam, Erode, Udumalpet and Sulur as also the Tiruvannamalai society in North Aroct district were approached for considering the suggestion of setting up licensed warehouses. Among individuals Sri R. Sethuraman of Sri Sriram Rice Mills, Mannargudi, has also agreed to take up warehousing. Further work is in progress.

National Five-year Plan.—No direct work for development of marketing under the Five-year Plan was attempted though the subject was mooted for consideration in the schemes of Community Project blocks and National Extension Service areas. It was held in respect of a proposal for warehouses under the National Extension Service Scheme in Tanjore district that marketing aspects are yet to be included by the Government of India within the purview of these schemes.

Work done on behalf of the heads of departments and other States.—Data on various subjects relating to production, supply, movement and prices and other economic aspects, were supplied to heads of different departments in the State and in other States. This work formed one of the important functions of the Marketing Section. Many samples of rice and paddy were analysed on behalf of the Board of Revenue (Civil Supplies) and opinion as to the quality was offered. As ordered by the Board of Revenue rice milling tests on Kuruvai paddy were conducted at Turuvarur and results were furnished. The production and marketing data with indication of exportable surplus of onions, chillies, jaggery, groundnut, grounnut oil, groundnut cake, bran and shall husks and potatoes were worked out and furnished to the authorities. A special report was also submitted to Board of Revenue on the probable causes leading to the sharp and rapid rise of tamarind prices during the year as also a report on the fall in prices of coconuts in Malabar district.

Transport.—Export and import data from the Customs records and important railway statistic of movements for the various agricultural commodities were collected as already stated in paragraph 2. Export interests like the potato exporters at Mettupalayam and mango merchants at Vellore were given all possible help in getting speedy and adequate wagon-supply for these perishable articles. A case for reduced railway freight on sugarcane for supply to the Sugar factory at Kulitalai was investigated and reported on.

Review of prices and market conditions.—There was an all-round fall gradually in the prices of all commodities in the year with the exception of chillies, tamarind and onions which were in short supply. The fall in prices was more marked in the case of foodgrains and this was largely ascribed to the increase in production consequent to improved seasonal conditions as also to the removal of restrictions and control on the prices and movements. The prices of important export commodities like pepper, cashew, kernals, cardamom and lemongrass oil registered considerable fall during the year though there was a slight improvement in the case of pepper in the closing weeks of June 1954.

The course of prices of important commodities during 1953-54 is briefly given below :—

(*a*) *Rice.*—The price of paddy and rice jumped temporarily from Rs. 16 to Rs. 18 and Rs. 25 to Rs. 30 per standard maund respectively during September 1953 as a result of the scramble for imports from Andhra for stock-piling for fear that movement restrictions might be imposed after the partition of the State from 1st October 1953. But these fears were soon allayed with the announcement of the Government of India that the partition will not disturb the existing arrangements for the distribution of foodgrains from the concerned area. From the commencement of October 1953 with the improvement in seasonal conditions throughout the state and copious arrivals of Kuruvai paddy besides arrivals of imports from Andhra and Burma easy conditions in paddy and rice markets commenced setting in. Up to December 1953 the prices remained at Rs. 18 to Rs. 22-8-0 per standard maund of rice. After the samba harvests in January and February 1954 still further recessions in prices were noticed in the ensuing period with the ruling rates in June 1954 standing at Rs. 16-8-0 to Rs. 21 per maund of rice. Rice was available in plenty everywhere in the State.

(*b*) *Millets.*—The fall in prices of millets was more marked than in other foodgrains. This is ascribed to the ample rainfall and good seasonal conditions during the year accounting for larger areas under millets and better yields. The prices of ragi, cumbu and cholam per maund opened in October 1953 at Rs. 11-11-0 to Rs. 16-8-0 and Rs. 13-8-0 to Rs. 17-13-0, Rs. 14-15-0 to Rs. 19-9-0 respectively. During the course of the latter three quaters in the fasli year a very steady decline set in and finally the price levels reached in June 1954 were Rs. 10-11-0 for cumbu and cholam and Rs. 9-10-0 for ragi. There is no dearth of millets in the districts.

(*c*) *Pulses.*—Satisfactory local production coupled with large imports from Madhya Pradesh, Bombay, Hyderabad and Bengal where bumper harvests are reported, contributed largely to the lowering of the prices of all the pulse varieties in the State. The following opening rates in October 1953 and closing rates in June 1954 will reveal the considerable fall in the prices for the different pulses during the course of the year :—

(Price in rupees and annas per Indian maund of 82-2/7 lb.)

	Opening October 1953.			*Closing June 1954.*		
	RS. A. P.		RS. A. P.	RS. A. P.		RS. A. P.
Bengalgram	19 3 0	to	20 13 0	12 13 0		
Redgram	15 5 0	to	18 5 0	13 4 0		
Blackgram	18 3 0	to	21 7 0	16 5 0		
Greengram	14 15 0	to	17 7 0	9 10 0	to	15 4 0

It is also reported that considerable stocks of greengram is held up with the growers due to declining and low prices.

(*d*) *Oilseeds.*—The prices of groundnut kernels ruled high at Rs. 22-8-0 to Rs. 29-12-0 per standard maund in October 1953 in the important markets. They declined gradually and reached Rs. 21 to Rs. 23-4-0 in June 1954. The price of groundnut oil also registered a dip from Rs. 47-7-0 to Rs. 61-11-10 per standrad maund in October 1953 to Rs. 43-7-0 to Rs. 46-13-0 in June 1954. The price of gingelly which opened at Rs. 36-4-0 ruled more or less firm till November, when in the course of two months it weakened with the new arrivals and touched Rs. 25-8-0 to Rs. 29 in December 1953 in different markets. Thereafter the prices remained more or less steady till the end of the June which closed at Rs. 25/Rs. 26 at Madurai, Rs. 26/Rs. 29 at Tiruchirapalli and Rs. 28/Rs. 29 at Madras City.

(All per standrad maund.) Copra at Kozhikode revaled a tendency to drop steadily and fell to Rs. 365 to Rs. 385 per candy of 700 lb. in November. However the price rose up from December 1953 onwards till May 1954 when it touched the peak level of Rs. 417 per candy of 700 lb. for office quality. In the case of edible varieties (viz.) Dilpasand, Madras and Rajpur the rates shot up to Rs. 660 per candy in May 1954.

(*e*) *Arecanuts.*—The price of processed arecanuts per 100 lb. ruled at Rs. 118 to Rs. 144 at the opening period of the report in the Kozhikode market. It reached Rs. 152 for Choor and Rs. 126 for Aylan. These prices remained more or less steady till May 1954. At Mangalore this time there was a dip in prices resulting from the stoppage of shipping at the port while an appreciable increase was registered in the prices of arecanut at Kozhikode market which feeds the internal markets by rail despatches. June prices at Kozhikode closed down at Rs. 175 to Rs. 192 per bag of 100 lb. Choor and Rs. 130 to Rs. 136 for Aylan varieties.

(*f*) *Cane jaggery.*—Price of cane jaggery opened at Rs. 21 to Rs. 24 per standard maund in October 1953 and steadly declined in the following months and ruled dull at Rs. 12–5–0 to Rs. 18–2–0 during the closing period of June 1954.

(*g*) *Tamarind.*—The price of tamarind increased abnormally in 1953 due to heavy demand and depleted stocks. The crop in 1954 was also placed as low as 80 per cent of normal production due to the cyclonic conditions and the felling of trees for fuel purpose. The rates which remained steady at Rs. 22–15–0 to Rs. 34–7–0 per standard maund shot up to a high level to Rs. 31–4–0 to Rs. 52–11–0 per maund during early part of May 1954. With the announcement of restrictions on the export of this commodity by the Government of India, the prices became subdued and further inflation was prevented. There are no immediate signs of a return to normal price conditions considering the low stock position and the steady demand throughout the year. Further this is an indispensable article in the South Indian diet and the demand is always on the increase. The market for tamarindruled at Rs. 23–1–0 to Rs. 41–3–0 per maund at the closing of June 1954.

(*h*) *Cotton.*—Price of Cambodia lint which stood at Rs. 900 per candy of 784 lb. at Tiruppur in October 1953 declined to Rs. 751 by June 1954. Karunganni lint also registered a fall in price from Rs. 805 to Rs. 642–8–0 during the year. The kapas market, both for Cambodia Karunganni which ruled firm, started declining and the dip in prices of Karunganni kapas was from Rs. 101 down to Rs. 62–8–0 per pothi of 280 lb. at the closing period of June 1954 while Cambodia kapas which opened at Rs. 127 to Rs. 132 dropped to Rs. 83–8–0.

(*i*) *Tobacco.*—The prices of tobacco experienced a steady decline for both chewing and cherroot varieties in Coimbatore markets. In Tiruchirappalli the price for cherroot variety remained firm with a slight tendency to increase towards the closing period under report. The chewing variety, however, came down in prices gradually towards the close. The prices were as follows :—

	Opening October 1953.				Closing 30th June 1954.					
	Coimbatore.		Tiruchirappalli.		Coimbatore.				Tiruchirappalli.	
	Rs.	A.	Rs.	Rs. A.	Rs.	A.		Rs.	A.	Rs. A.
Chewing I	52	8	65	98 12	49	6	to	65	13	
,, II	45	0	50	70 0	32	15	to	41	2	62 8
,, III	40	0	45	57 9	16	7	to	27	10	52 11
Cheroot and cigar I				102 14	41	2	to	49	6	42 13
,, II				85 5	19	12	to	24	10	115 7
,, III				65 13	8	3	to	9	14	95 10
										79 2

(*j*) *Pepper.*—Dull conditions set in during October 1953 when the prices decended steadily and reached Rs. 1,200 per candy (700 lb.). Except for a brief spurt in December 1953 when the rates again touched Rs. 2,300, the rest of the period experienced a progressive downward trend until the lowest rate of Rs. 750 was reached in the first week of June 1954. There was however a merked improvement in prices towards the closing period of June 1954 when the prices stood at Rs. 1,075 to Rs. 1,100.

The price conditions on the whole appear to be gradually moving down and the prospects of a general slump in all agricultural commodities within the next two or three years is already visualized leading to a demand for price stabilization at economic levels.

From a study of the index numbers of wholesale prices published by Economic Adviser to the Government of India the outlook for the agricultural commodities generally appear to be rather dull with the fall in prices of food articles and a rise in those of manufactured articles. This trend is fully reflected in the official index for the wholesale prices of commodities (Base 1939=100). Thus over the year ended 30th June 1954 the index prices for food articles show a marked fall of 61·0 points from 399 on 27th June 1953 to 338 on 26th June 1954. Similarly the figure for industrial raw materials has staged a recession from 478·02 to 431 on the same dates referred above. The index for manufactures on the contrary shows a rise of 9·1 points from 369·61 on 27th June 1953 to 378·7 on 26th June 1954. The index numbers for the wholesale prices in Madras State for the period ending 29th May 1954 were as follows :—

Foodgrains	451
Commercial products ..	449

XVII. LEGISLATION AND STATISTICS.

Weekly cotton mill and press returns.—In accordance with section 5 of the Cotton Ginning and Pressing Factories Act, 1925, the ginning and pressing factories and the cotton mills in the State have been submitting weekly returns in the prescribed forms. The weekly statistics are compiled and published in the *Fort St. George Gazette*. Copies of these Weekly Statements are also being sent to the Economic Adviser, Government of India, New Delhi, Indian Central Cotton Committee, Bombay, dand the Secretary, East Indian Cotton Association, Limited, Bombay.

Cotton Transport Act—Annual General Licence.—Seventy-two licences with 2,267 certified copies were issued to the mills for the transport of ginned cotton for the purpose of manufacture during the year from 1st February 1954, as against 66 licences with 1937 certified copies issued during the previous year.

Single licences by sea.—During the year 230 sea licences were issued for the transport of 96,470 bales of 392 lb. each of ginned cotton for the purpose of spinning.

Single licence by road.—Fourteen licences were issued during the year for the transport of 840,222 lb. of ginned cotton and 29 licences were issued for the transport of 277,100 lb. of cotton waste and mill sweepings into the protected areas of Cambodia and Tirunelveli areas.

Single licence by rail.—Twelve (single) licences were issued during the year for the import of 650,300 lb. of ginned cotton, 13 licences for the import of 500,755 lb. of unginned cotton and 63 licences for the import of 947,220 lb.

of cotton waste and mill sweepings into the protected area notified under the Cotton Transport Act to spinning mills and dealers and exporters during the year. A single licence was also issued to import 158 bags of cotton seeds into Tirunelveli area for the purposes of cattle food. The details of licences issued for the import into the respective areas during the year are given below :—

Number of licences.	Kind of cotton.	Quantity in lb.	Purpose.
	A. Cambodia area.		
78	Cotton waste and mill sweepings.	1,553,120	Cleaning, willowing and pressing for export.
11	Ginned cotton	641,300	Spinning yarn and sale.
13	Unginned cotton	452,925	Ginning and sale.
	B. Tirunelveli area.		
14	Cotton waste and mill sweepings.	70,000	Willowing, cleaning and pressing for export.
7	Ginned cotton	128,400	Spinning yard and sale.
1	Unginned cotton (Kapas) ..	48,000	Ginning and sale.
1	Cotton seeds	158 bags.	Cattle food.

In G.O. Ms. No. 46, Agriculture, dated 5th January 1954, Government have ordered the re-alignment of the boundary between the Tinnies and Cambodia areas to run through main roads, where effective check by the Police could be made.

Cotton 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 and continued in 1952–53 also. As the schemes proved popular, they were continued in 1953–54 also as per G.O. Ms. No. 284, Industries, Labour and Co-operation, dated 9th February 1954.

A Certification Officer (of the status of Assistant Cotton Specialist) aided by a Gazetted Assistant, 6 Inspectors, 10 fieldmen and 10 maistries 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-opeartion of the grower, the trader and the gin and press owners, is quite essential for the success of the scheme.

The Madras Agricultural Pests and Diseases Act.—The Act was in force during 1953–54 against the following pests and diseases :—

(1) Sugarcane smut and borers in Karur taluk.

(2) Hairy-caterpillar pest in North Arcot district.

(3) Cotton boll-worms in Tiruchirappalli, Salem, Madurai and Coimbatore districts.

(4) Paddy-jassids in the districts of Chingleput, North Arcot and Tirunelveli.

7. *The Cotton Control Act*, 1952.—The Act was enacted to be in force in the State and rules under the Act are under consideration.

The Madras Sugar Factories Control Act, 1949.—After the formation of Andhra State from 1st October 1953, the Madras Sugar Factories Control Act, 1949, became applicable to the districts of South Arcot, North Arcot, Salem, Coimbatore, Tiruchirappalli, Madurai, Chingleput and Tanjore. The Director of Agriculture continued to function as the Sugarcane Commissioner for the Residuary State. Of the four sugar factories in the Residuary State situated in (1) Nellikuppam, (2) Pugalur, (3) Pandiyarajapuram and (4) Mailpatti, the factories in the first three centres alone worked during the crushing season of 1953–54. The Mailpatti factory did not work during the whole period.

Sugarcane Advisory Committee.—No meeting of the Advisory Committee was held from 1st October 1953 onwards, since the Advisory Committee for the Residuary State was constituted only in July 1954 (G.O. No. 2446, Agriculture, dated 23rd July 1954).

Special staff.—The post of Cane Development Officer at headquarters was abolished from 1st November 1953, for the Residuary State, since that post was allotted to the Andhra State in G.O. No. 1631 Agriculture, dated 30th October 1953. The posts of one upper division clerk, one typist and one peon in the office of the Director of Agriculture were also discontinued from 1st November 1953, in view of the revised strength of staff sanctioned for the Director of Agriculture's office in G.O. No. 1631, Agriculture, dated 30th October 1953.

Two Upper Subordinates, each to assist the Superintendents, Sugarcane Liaison Farms, Nellikuppam and Kulittalai, were employed in the Residuary State from 1st November 1953, to attend to the day-to-day enforcement of the Madras Sugar Factories Control Act, 1949. The headquarters of one Upper Subordinate was at Nellikuppam in South Arcot district and that of the other was at Pandiyarajapuram in Madurai district.

Price fixation of sugarcane during 1953–54.—The minimum cane price notified by the Government of India, viz., Re. 1–7–0 per maund for gate delivery and Re. 1–5–0 per maund for rail delivery was applicable to the Residuary State. Payment of cane price according to SISMA formula was allowed to be worked on a voluntary basis between the factories and the cane suppliers.

XVIII. SOIL CONSERVATION.

A draft Bill to replace the existing Madras Land Improvement Schemes (Contour Bunding and Contour Trenching) Act, 1949, was drafted in order to carry out soil conservation measures quickly and effectively and the proposed legislation is under the consideration of the Government.

During the year under report the Central Soil Conservation Board of the Government of India was formed at New Delhi with a view to co-ordinate the efforts of the States, to approve the State Schemes of soil conservation and recommend for the Central Financial Aid to States. The Technical Sub-Committee of the Central Soil Conservation Board approved the States schemes formulated for setting up Soil Conservation Demonstration Centres in the districts of Coimbatore, North Arcot, South Arcot and the Shevaroys in Salem district.

The progress made in the execution of soil conservation schemes is furnished below :—

I. *Nilgiris district*—(i) *Pilot Scheme.*—The work in the pilot scheme over an area of 88·65 acres was completed during last year except one item, viz., grass planting and establishment of trees on the Railway poramboke lands. Due to the delay in the receipt of the acceptance by the railway authorities for the execution of works, it could not be taken up during the year, but was started in July 1954.

Immediately after the completion of the various soil conservation measures with bench terracing and contour bunding and trench drainage as the main features in the Pilot Scheme area in Ketti valley, the ryots took to sowing of potatoes. The luxuriant growth of potato crop on the area bench terraced presented a striking contrast to the crop growth on the adjoining unprotected areas. The comparative results of observation plots selected at random revealed that the yield of potato in the terraced area was uniformly more than 40 per cent over that of the unprotected area. As a result of the enthusiasm thus aroused in the ryots, they waited on the Land Revenue Commissioner and the Secretary to Government, Agriculture Department, on deputation and requested to the further extension of soil conservation schemes over larger areas.

Government have also approved the proposals to maintain the soil conservation works already executed over the Pilot Scheme area in Ketti valley for a period of two years at Government cost and then leave them to be looked after by the ryots themselves.

(ii) *Extension Scheme.*—Government have sanctioned a scheme of soil conservation over an area of 203·35 acres lying contiguous to the area included in the Pilot Scheme and forming the remaining portion of the selected sub-catchment of the Ketti stream in G.O. Ms. No. 4821, Development (Planning and Development), dated 31st October 1953. Immediately the various preliminaries contemplated in the Madras Act XXII of 1949 were gone through the letters of consent from the affected pattadars were obtained before starting the works. The works were entrusted to a contractor after inviting tenders and so far about 90 acres were bench terraced and handed over to the ryots for cultivation. The terracing work has been suspended temporarily on account of the monsoon. During May and June 1954, other soil conservation measures like contour trenching and afforestation, gully plugging and smoothening of the course of the stream were attended to.

The details of the progress of work are furnished below :—

Bench terracing—90 acres,
Graded trenching and afforestation—2·5 acres.
Number of tree-seedlings planted—4,000.
Gully plugging—1.

(*a*) *Scheme for Agricultural Research Station, Nanjanad.*—With a view to provide proper soil conservation measures like bench terracing on steep slopes included in the Agricultural Research Station, Nanjanad, Government sanctioned a scheme for soil conservation and directed that the works be carried out with tractor power, deputing a special Agricultural Engineering Supervisor for supervising the work. Accordingly 2 D. 4 tractors with bull-dozer attachments were utilized for bench terracing of the farm lands and they have worked for 382 hours net and completed bench terracing over 10 acres. Speedy progress could not be achieved on account of certain mechanical breakdowns and the initial nervousness of the drivers to work the mechines on steep slopes to which they have not been previously accustomed.

(*b*) *Other areas.*—At a request of the Director of Animal Husbandry, Madras, the detailed topographical and contour survey and Dunsandal Sheep Farm at Ootacamund was completed and plans and estimates together with scheme proposals were sent. Government have stated that the scheme will form part of the Second Five-Year Plan.

It has been proposed to carry out soil conservation measures in the Ergot Farm near Muthorai in Nilgiris district. Accordingly the topographical and contour survey of the area of 40 acres was taken up and detailed estimates,

Plans and scheme proposals were prepared during the year. Government will be approached for sanction in due course.

On a request from the ryots of the Kammandhu village adjoining the Pilot Scheme area, the Board of Revenue desired the formulation of scheme proposals for soil conservation works over 200 acres of the village forming a self-definited sub-catchment. The scheme was prepared and it is under the consideration of the Government.

As desired by the Secretary to Government, Agriculture Department, detailed scheme proposals to carry out soil conservation works in the whole of Ketti valley basin over an area of about 5,500 acres were prepared and they will be submitted to Government in due course.

As directed by the Nilgiris District Soil Conservation Board, a Seven-Year Plan was prepared in order to cover the whole of the Nilgiris district with soil conservation measures by the end of the Second Five-Year Plan period. The scheme is under scrutiny and it is expected that the Central Government would consider the grant of special loans for implementing the scheme.

Government also sanctioned a special scheme to grant special takkavi loans to the Nilgiris ryots to carry out soil conservation works at the rate of Rs. 1,500 per individual ryot. It is proposed to sanction loans to ryots owning lands at the top of the catchment as far as possible.

II. *Coimbatore district.*—The soil conservation scheme which was started as a famine relief measure in Mulanur, Dharapuram taluk, in 1952 was continued during the year under report. The main feature of contour bunding which involved only earthwork excavation and which by itself could provide large-scale unskilled work for the famine stricken villagers, was almost completed during the last year. The other soil conservation measures like sectioning of bunds, constructions of waste weirs at critical points to allow overflow of excess rain water, gully plugging and check dams, etc., were attended to. On an average only 300 labourers were given employment daily. Details of the progress achieved are given below :—

Area contour bunded up to the previous year	6,000	acres.
Area contour bunded during the year	708	,,
Number of waste weirs constructed—		
Up to the previous year	Nil.	
During the year	272	acres.
Progressive total	272	,,
Number of check dams constructed—		
Up to last year	Nil.	
During the year	20	
Progressive total	20	
Turfing bunds—		
Up to previous year	Nil.	
During the year	2·28·641	r.ft.
Progressive total	2·28·641	,,
Seeds of economic trees sown to serve as wind belt—		
Up to previous year	Nil.	
During the year	3·15·446	r.ft.
Progressive total	3·15·446	,,
Number of labourers engaged during the year—		
Men mazdoors	34,501	
Women mazdoors	19,037	
Children mazdoors	2,493	

The proposal for training farm managers of the Government Livestock Farms of the State was sanctioned by the Government. The trainees are proposed to undergo the course in November 1954 when the soil conservation works will be resumed in the extension scheme area.

Surveys were conduct in the following areas to carry out soil conservtion measures :—

Tiruchirappalli district—Perambalur taluk.
Community Project areas in Madurai district.
Do. in South Kanara district.
Co-operative Land Colonization Society at Tengumarhada of the Nilgiris district.
Government Livestock Farm at Thiruvazhamkunnu of Malabar district.
Land Colonization Societies at Alathi-Vachinampalayam near Mettupalayam, Andhiyur, Gettisamudram, Athani and Nagalur near Andhiyur of Coimbatore district.
Wynaad Colonization Scheme at Agricultural Research Station, Ambalavayal.
Co-operative Land Colonization Societies in the villages of Mullgoor, and Ebbanad in Nilgiris district.
National Extension Service Block, Tiruvellore, Chingleput district.

Proposals have been sent to the Government to train Revenue subordinates of Coimbatore district in soil conservation technique so that they can educate the ryots on the advantages of soil conservation measures.

At Dharapuram, one Farm Manager of the Hosur Cattle Farm was given training in soil conservation in theory and practice for six weeks.

The following soil conservation schemes have been sanctioned by Government for Coimbatore district and they are expected to operate in the beginning of the next fasli year 1954–55.

Kothamangalam fuel series—4,046 acres (in G.O. Ms. No. 1803, Agriculture, dated 1st June 1954).

Kangavam-Vellakoil—6,000 acres (in G.O. Ms. No. 1732, Agriculture, dated 24th May 1954).

XIX. AGRICULTURAL ENGINEERING.

The Agricultural Engineering Branch was engaged in arranging supply of suitable agricultural implements, oil engine and electric motor pumpsets for irrigation and mechanical cultivation units as tractor with matched implements and bulldozers. There was great demand for power machinery for cultivation and irrigation purposes.

I. *Tractors*—(i) *Tractor and land reclamation.*—Departmental tractors are now regularly used for ploughing, harrowing and also for puddling, trampling green manure into puddled wet lands with rotavator attachment. The advantages of rotavating are being more fully realized by agriculturists who have actually used them on their lands. There has been similarly increasing demand for the same from the sugarcane growing areas of South Arcot.

Bulldozers are used in all the districts for the levelling and bunding of eroded fields and also for the reclamation of waste lands and clearance of virgin areas. The same units are now usefully employed for the restoration of sand cast areas in flood damaged places and also for the systematic excavation of badly silted tanks. Silt removal in tanks and spring channel excavation are also normal uses to which these labour-saving power equipment are employed.

There is a popular demand for bulldozers in the hilly tracts of the Nilgiris for purposes of bench terracing on contours and for ploughing and other tillage operations. The work carried out at Nanjanad over the area, selected for effecting soil conservation measures with the help of the caterpillar bulldozers, has become very spectacular for the whole district.

As a result of this mechanical contour terracing and trenching done in an excellent manner combining both speed and economy, many of the other landowners in the adjoining areas have since requested for the supply of bulldozers for having their areas similarly contour trenched and bench terraced to arrest soil erosion and conserve moisture to the maximum extent. Two of the bulldozers in the Nilgiris district have already been moved for this purpose and are still working on individual estates to the full satisfaction of the owners of the lands. Some more machinery are being moved to this hill tract for tackling the increasing needs of ryots for reclamation and soil conservation. Many of the bigger and more enterprising ryots have purchased their own tractors. There are nearly 220 tractors in the State owned by private individuals at present and this is steadily increasing year by year. Due to the partition of the State, only 159 units, 85 tractors with bulldozer attachments and 74 tractors with allied equipments were available to the Residuary State. The allotments to the different districts of these machinery and the stock of tractor-drawn implements are shown in the appendices . No new machinery were purchased during the period under report, as decided at the meeting of the Planning Committee.

A statement showing the acreages tackled by the departmental tractors in the State from 1st October 1953 is furnished in the Appendix 33. Out of the total outturn of 16,635 acres, 4,736 acres have been newly reclaimed from virgin areas and the rest are abandoned fallows which had remained uncultivated for several seasons, and are not easily capable of cultivation by animal power. An additional production of about 1,481 tons of foodgrains is estimated to have accrued from these reclaimed areas and abandoned fallows at the rate of one-fourth ton per acre of virgin land and one-fortieth ton per acre of fallow land. Though the season was normal in certain districts drought conditions continued to prevail during the year in some of the dry districts like North Arcot, Salem and Ramanathapuram. Due to the drought condition which resulted in lack of sufficient moisture in the soil and financial difficulties experienced by the agriculturists, the demand for bulldozers and tractors was not up to the extent expected.

The receipts to the department by way of hire charges during the year is Rs. 7,76,864. A constant watch is maintained on the progressive receipts to ensure that the service is taken on no loss no profit basis. There is also a proposal to increase the present rates of hire charges on a graded scale to achieve this and as the present rates are not found sufficient for keeping the tractor scheme running on a completely no profit no loss basis, at the same time without straining the paying capacity of the agriculturists and giving the land reclamation scheme a severe set-back. A tabular statement showing the different rates of hire charges collected in different States including the Madras State are given in Appendix 39.

In order to increase the outturn with the present set-up of staff and without increasing the expenditure a proposal is under consideration to work the tractors in shift system utilizing the services of the spare oil engine drivers in the State for tractor driving after giving them necessary training. This is considered quite practicable as the seasonal requirements of oil engines and tractors for actual cultivation are only continuous and not concurrent.

The Government of India have since formed a Committee to go into the question of finding out ways and means to improve the efficiency in running the tractor scheme in the State. This Committee has been sitting and discussing several topics on this subject and has arrived at a certain amount of standardization of spares and services.

(ii) *Supply of tractors under hire-purchase system.*—This scheme is gaining appreciable popularity among the more enterprising and progressive agriculturists who are keen to have their own tractors according to their own choice but are unable to purchase them for cash. The number of applications for supply of tractors under the scheme is increasing. This scheme aims at supplying tractors together with matched implements on instalment basis spread out over seven years. Twenty-three tractors (particulars are given in Appendix together with matched implements were supplied under the scheme during the year in this State, and they are all being put to very good use by ryots for various field and haulage operations. While during the cultivation seasons the machinery are put to intensive use on the fields for tillage, they are employed to advantage for haulage of produce and agricultural transport as a regular feature and on a profitable basis by all the owners. The outturn of these tractors is estimated to be 9,200 acres. This scheme is proposed to be retained in the coming years also.

(iii) *Five-Year Plan of Tractor Schemes.*—The following is the programme for the remaining period of the plan under tractor scheme :—

Year.	Amount allotted under hiring scheme.	Amount allotted under hire-purchase scheme.	
		Amount. Rs.	Units.
1954–55	22·91	11·40	23·33 *
1955–56	17·00	4·60	23

With a view to bringing under cultivation all available waste lands in the State which are fit for cultivation, it is proposed to fully equip the bulldozer units in this department and for this purpose the District Agricultural Officers have been asked to discuss details with the Collectors of their districts and submit suitable proposals.

(iv) *Sugarcane Development Scheme with tractors.*—Two units intended for the improvement of sugarcane cultivation worked in the districts of North Arcot and South Arcot. The outturn of these units are as follows :—

	Acs.
Total area ploughed	897·
Total area harrowed	17·1
Total area ridged	92·1
Total area of dry ploughing done in paddy fields ..	13·83
Total area puddled	64·00
Number of ryots benefited by the use of tractors ..	149·

The tractor stationed in North Arcot district for operation in connexion with sugarcane cultivation has since been moved to Chingleput district after the sugarcane season. There has also been a steady increase in the demands for tractors in the factory area of South Arcot district for tractors for ploughing and ridging sugarcane fields, as deep ploughing was found beneficial for sugarcane.

(v) *Tractor Workshop, Coimbatore.*—The Tractor Workshop, Coimbatore, was stabilized with the object of taking up servicing and complete overhauling of tractors and bulldozers in this State manufacturing and reconditioning of

* Represents the balance of previous year's allotment undistributed.

old tractor spares as now and then many of the spares would not be received in time from firms and to recondition them would be cheaper rather than to wait and purchase new ones. During the period under report one portable grinder, one portable drill, one slotting attachment for the Cinicianiatti milling machine and one Keetona K-4 sheering machine (hand operated) were installed in the Tractor Workshop. The Morgan's crucible lift over oil furnace which was received from Greaves Cotton and Company was also installed.

The regional stores at the Tractor Workshop is stocking the spare parts required for the tractors working in the various districts of the State. The indent for the spare parts from District Officers were promptly complied with.

During the year seven D-7 and two D-6 caterpillar tractors were completely stripped out part by part, overhauled and re-assembled. They were also fitted with rear power control units. Six tractors were taken up for servicing and the track bushes were turned to 180°. Besides these five numbers of 20-K Massey Harris tractors were completely painted with the spraying equipment.

Another important and useful item of work on the servicing side is the successful gas welding of cracked D-7 engine block by pre-heating which was lying at the Tractor Workshop after numerous unsuccessful trials. One craked cylinder block of jeep was also welded by pre-heat treatment and one lorry was overhauled besides converting a four-wheeled cobey waggon into steel body for withstanding heavy weights of ploughs and other implements.

The Assistant Agricultural Engineer in charge of the Tractor Workshop was also in charge of the inspection work in Coimbatore and Nilgiris districts with the help of additional technical staff. He was also in charge of the tractors and bulldozers working in Coimbatore district. In order that the Assistant Agricultural Engineer may be solely in charge of the Tractor Workshop for efficient working of the workshop, proposals had been submitted to Government for taking away the additional work of inspection, etc., from the Assistant Agricutural Engineer and order of Government have just been received. With the taking away of the additional work of inspection from the Assistant Agricultural Engineer, the Tractor Workshop is expected to work more efficiently.

II. *Assistant Agricultural Engineers.*—A statement showing the jurisdiction of the different Assistant Agricultural Engineers is shown in the Appendix. The Assistant Agricultural Engineers in the various regions regularly toured in the districts assigned to them.

A detailed check and inspection over the various operations, maintenance and outturn of every individual machine was carried out by them in a systematic manner. Prompt attention was paid to put into commission the machinery which needed repair or renewal of parts with the materials available locally and from the Tractor Workshop, Coimbatore. The need for a well-equipped mobile workshops in the districts for attending to repairs to engines, tractors and other farm machinery is being increasingly felt in all parts of the State. The Assistant Agricultural Engineers have given instructions to the tractor drivers and cleaners during the 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.

A list of machinery purchased during the year is furnished in the Appendix.

III. *Training to oil engine drivers and tractor drivers.*—One more batch of oil engine and tractor drivers was given training in the Research Engineer's Workshop from 15th December 1953 to 14th April 1954 in the proper maintenance, operation and overhauling of oil engines and tractors. The third batch which joined up on 15th April 1954 is receiving training.

IV. *Oil engine pumpsets for hire.*—During the period under report oil engine pumpsets were continued to be given on hire to ryots for irrigation under the scheme of land development by mechanical power lift irrigation at the normal rates fixed for this purpose. There was very heavy demand for oil engines and pumpsets in South Malabar district and oil engines from other districts were diverted to meet the suddenly increased demand from ryots for irrigating paddy crops. There is demand for small horse-power oil engines and proposals have been submitted for acquisition of 40 small horse-power engines.

There was a keen demand for oil engines for use for non-agricultural purposes also and this was also met without detriment to the use for agricultural purposes. In such cases, double the rate of the usual hire charges was charged and the special sanction of Government was obtained in all cases when oil engine were issued for non-agricultural purposes.

About 29 oil engines of the hiring scheme have been issued for regular use to the Agricultural Research Stations to meet the need at these stations and proposals have been sent to Government for the permanent transfer of these engines to the stations.

The question of keeping some oil engine pumpsets at the taluk headquarters for the greater convenience of the ryots was discussed at some length with the District Officers at the conference of the departmental officers held in August 1954 at Coimbatore. It was generally accepted that such a decentralized arrangement would be more beneficial to the farmers that the various taluks could be served better and in a more equitable manner, that this would also save some expenditure on transport of these units over long distances as at present from the district headquarters and that this new location at the various taluks would also more readily serve to the ryots in the areas that are situated far away from the district headquarters. Accordingly the District Officers were requested to give effect to the above suggestion wherever possible and feasible without any extra expenditure to Government and with an eye to cut down the transport and maintenance costs and thus effect economics wherever possible. From the reports received on the working of the scheme, it is seen that this decentralization has been generally beneficial and more helpful to ryots. The District Officers have been asked to continue the working of this scheme and also such modifications which may lead to a better service to agriculturists.

Government have permitted in G.O. Ms. No. 148, Agriculture (Food Production), dated 6th May 1954, the hiring of all engine pumpsets by this department to ryots in whose lands filter point wells are sunk under the Filter Point Scheme for a short period of less than ten days for purposes of trial pumping from the filter point wells and the waiver of the collection of caution deposit money from the applicants for the hiring of the departmental oil engine pumpsets as the need in these cases will be only for a few days for each individual.

Requests were received for the outright sale and under hire-purchase for some of the oil engines given on hire and have been complied with as Government have permitted the sale of 25 per cent of the hire units to the ryots.

The number of sets available for hire in the Residuary State after the separation of the Province is 440 excluding the number of oil engines lent for working in the Agricultural Research Stations. The number of sets, electric and oil engines, privately owned by the ryots in the districts are 14,835 electric motors and 14,506 oil engines respectively and the development of power lift irrigation both with electric motors and oil engines has been proceeding steadily all over the State for agricultural purposes.

During the period under report the following number of oil engines have been sold by the established importing firms direct to agriculturists for agricultural pumping operations in the Residuary State :—

	NOS.
Crossley Brothers, Crossley engines	8
Jayems Engineering Company, Clayeys engine, E. type.	20
Russel and Newberry engines	31
Marshall Sons & Co. (India), Limited, Cooper engines	94
Batli Bai & Co., Daihatsu Japanese	9
British Eastern Engineering Company, D.L.I., horizontal.	9
Parry & Co., Kirloskar	35
Textool & Co., Textool engines	99
Greaves Cotton & Co., Ruston oil engines ..	44
Total ..	349

In addition to the above number a large number of units have also been sold by the several dealers and sub-agents of the makers.

V. *Petrol-driven pumpsets.*—The small petrol-driven pumpsets were also continued to be issued on hire during the year under report. But the number available for hire and in good working order was only about 20 as the other units have become unserviceable on account of constant use and as almost all the sets have served their life for a period of over eight years. The available sets were given on hire when there was demand and were also utilized for testing the filter point wells after erection as these sets are small and easily portable. Steps have also been taken to examine and dispose of the non-usable units and to sell them in public auction.

VI. *Oil engine and electric motor pumpsets on hire-purchase system.*—The scheme for the supply of oil engines and electric motor pumpsets under hire-purchase system was continued to operate as a regular features during 1953–54 and underwent several policy change in the matter of the supply position.

(i) *Object of the scheme.*—The main object of the scheme is to arrange for the supply of suitable standard and recognized types of oil engines and electric motor pumpsets to poor and deserving tyots, owning 15 acres of wet land or 45 acres of dry land (1 acre of wet : 3 acres of dry) who are in need of State aids for improving their lift irrigation facilities. The cost of these unit is made recoverable in easy instalments ranging from three to five years with 4 per cent as interest and 3 per cent as centage charges to cover the cost of staff for the scheme.

(ii) *Inception and progress.*—With an initial target of 1,000 oil engines and 300 electric motors the scheme was started in October 1949. In the subsequent years 1950–51 and 1951–52, the targets were governed mainly by the amount available under the loans from the Government of India and 1,250

oil engines and 200 electric motors and 625 oil engines and 189 electric motors respectively were fixed for completion. The total units acquired for the Residuary State up to 30th June 1954 are furnished below :—

Oil engines—1,576.

Electric motors—424.

(iii) *Financial implications.*—The Government of India grant loans year after year to this scheme as part of the Five-Year National Plan since this is one of the items for expansion of power lift irrigation under the First Five-Year Plan. The purchase and distribution policy underwent changes from time to time as decided by the Government of India. Consequently revised instructions both from Union Government and State Government had to be followed as defined in paragraph 6 below. This coupled with the separation of Andhra State contributed to the time lag involved in arriving at a definite target and the original loan amount for Composite State sanctioned by the Government of India has to be split up in specific proportions between Andhra, Mysore and Residuary State based on the total number of units acquired from the inception of the scheme. There was no distribution of sets from July 1953 to May 1954. Only in the middle of January 1954 the split-up figures of the amount of loans granted by the Government of India for the Residuary State were sanctioned with revised targets as detailed below :—

Year to which sanction relates.	Amount granted for Residuary State.	Target sanctionad.		Sanctioned in G.O. No. and date.
		Oil engine.	Electric motors.	
	Rs.			
1952-53 allotment	11,40,700	250	150	G.O. Ms. No. 13, Agriculture, (Food Production), dated 21st January 1954.
Do. additional allotment.	1,84,300	41	21	G.O. Ms. No. 71, Agriculture, (Food Production dated 10th March 1954.
1953-54 allotment	13,18,800	326	140	G.O. Ms. No. 16, Agriculture, dated 23rd January 1954.
	26,43,800	617	311	

When all arrangements were ready for the actual distribution, the budget period for the year 1953–54 came to a close and at the request of the department, Government have been kind enough to re-allot the above loan of Rs. 26·44 lakhs, being the unspent balance, to be utilized during 1954–55. The scheme is now in progress.

(iv) *Selection of oil engines and electric motors.*—The State Government have ordered in G.O. Ms. No. Agriculture (Food Production), dated 6th January 1953, to purchase 80 per cent of the total supply of indigenous types of oil engines only through rate contracts entered into with the manufacturers direct by the Director-General of Supplies and Disposals, New Delhi. The balance 20 per cent of the target is selected from foreign types of oil engines and the entire indigenous electric motors are selected out of tenders called for from the various manufacturing firms in the country by this department. The rate contract lists fot Kirloskar, Cooper, Robus, Kama, Faria and Central oil engines were received only by middle of March 1954. It has been ordered by Government that these sets may be distributed in 1954–55. Under 20 per cent foreign types of oil engines, Russel Newberry Steyr, Bukh and French Vertical (Conord) are being supplied under Electric Motors, G.E,C. and P.S.G. are arranged to be distributed from the three selected firm, out of tenders called for in December 1953, and finalized in

March–April 1954 after entering into agreement with these firms as per conditions prescribed by Government.

(v) *Procedure to be adopted by ryots for getting the sets.*—Any ryot owning 15 acres of wet land or 45 acres of dry land (1 acre of wet land = 3 acres of dry land) and who is sufficiently solvent is eligible to receive the set on application in the prescribed form under hire-purchase system through the District Agricultural Officer concerned. The application is required to be supported by necessary solvency certificates obtained from the concerned Tahsildars. A surety bond on a stamp paper of Rs. 15 with two sureties and two witnesses has to be executed. The sureties should be from any ryot of any village of the same district but he should have neither been supplied with a set nor be an applicant to a set under the scheme. At the time of taking delivery of the set, he has to execute an agreement bond in the prescribed form on a stamp paper of Rs. 1–8–0 with necessary identification certificate. Initially the party has to remit 1/10th cost of the set as caution deposit money. Firm orders are then placed for the units cohosen by the ryot out of rate contract and from selected types of tender firms in the City. The cost of the set including 4 per cent interest and 3 per cent centage charges are finally recovered from the ryots in three or five annual easy instalment according to the maximum amount involved.

The actual expenditure incurred for the purchase of and distribution of pumpsets and receipts by way of collection of instalments are given below :—

Expenditure.

	Rs.	A.	P.
From 1st Octboer to 31st December 1953	16,422	8	6
From 1st January to 31st March 1954	23,621	0	0
From 1st April to 30th June 1954	9,357	10	0
Total ..	49,401	2	6

Receipts.

	Rs.	A.	P
From 1st October to 31st December 1953	1,22,613	15	0
From 1st January to 31st March 1954	1,04,237	4	6
From 1st April to 30th June 1954	81,266	7	0
Total ..	3,08,117	10	6

(vi) *Conclusion.*—The scheme has commended wide response from the agriculturists of this State. It is making steady progress and its success is due to the several inherent merits and the easy credit facilities extended to ryots at the time of need. Besides the re-allotment of Rs. 26·44 lakhs as loan of Government of India to be utilized during 1954–55 an allotment of Rs. 14 lakhs has also been made under the scheme during the year 1954–55. It is proposed to distribute 987 engines and 411 electric motors under hire-purchase system in the ensuing year 1954–55. This is one of the ways by which agricultural development can be steadily achieved with the full co-operation of the ryots.

VII. *Filter point tube-wells scheme.*—The scheme for the sinking of 400 filter points in the Residuary State for the year 1953–54 was started early in January 1954 and the Government of India sanctioned a loan of Rs. 11,14,400 for this purpose. The target fixed was completed by 30th June 1954 and it

was also found feasible to sink more number of filter points than the targed number as detailed below :—

District.	Target	Number of wells successfully sunk.	Number of loan applications sanctioned.
North Arcot	30	36	34
Chingleput	60	62	41
South Arcot	40	53	38
Tanjore	80	136	94
Pattukkottai	20	29	29
Tiruchirappalli	60	77	60
Madurai	40	53	32
Ramanathapuram	40	51	46
Salem	15	5	4
South Kanara	15	23	17
Total ..	400	525	395

The areas expected to be covered with irrigation water by these filter points will be 5,250 acres and the additional yield anticipated from this area will be 2,625 tons. It is proposed to continue the scheme next year and also do it on an intensive scale as a regular feature of the National Five-Year Plan for agricultural development.

There were enquiries from the ryots in the district other than those in which the scheme was worked and the various district officers were asked to render the necessary help to the ryots in the installation of filter points. The officers have also been supplied with the necessary tools and equipment for this purpose and Government have also ordered that a hire charge of Rs. 5 per day may be levied for the departmental boring equipment lent to the ryots for sinking filter point wells.

VIII. *River Pumping Scheme.*—The Assistant Agricultural Engineer sanctioned for the scheme joined duty on 17th March 1954 and the Agricultural Engineering Supervisor was subsequently posted. They visited various places in Chingeleput, South Arcot, North Arcot, Tiruchirappalli, Tanjore, Madurai, South Malabar and South Kanara districts and investigated the possibility and feasibility of starting as many river pumping schemes as possible. Proposals with full details for starting a scheme at Vallampadugai in South Arcot district were submitted to Government. Preliminary work for starting river pumping schemes at Perambakkam village in Chingleput district, at Puliangudi in Chidambaram taluk and at Thiruvangipuram in Walluvanad taluk was completed and proposals were formulated for starting river pumping schemes in these places.

The River Pumping Scheme worked at Muthur in South Kanara district last year could not be continued this year as the ryots were not willing to work the scheme on a no loss no profit basis. The River Pumping Scheme started for the third crop at Sajjippanadu village in South Kanara district was closed by the middle of May 1954. An area of 53·54 acres was brought under cultivation and a water-rate of Rs. 83–13–0 was levied per acre per crop.

The River Pumping Scheme sanctioned at Lakkidi-Perur and Lakkidi-Pallapuram in Walluvanad taluk in South Malabar were started. An area of 177 acres was brought under cultivation under the River Pumping Scheme at Lakkidi-Pallapuram. The scheme started at Lakkidi-Perur had to be discontinued as the ryots did not co-operate and were not willing to run the scheme on a no profit no loss basis. It has been since proposed to start the scheme in another site at Lakkidi-Pallapuram itself as the ryots there have agreed to run the scheme on a no loss no profit basis.

A River Pumping Scheme was started for the early raising of Kuruvai nurseries at Talanjeri village, Mayuram taluk, on the banks of the Pazhavar river on the same lines on which the River Pumping Scheme at Killithur was started last year. The scheme was worked for a month from 23rd June 1954 and stopped as the water has been let in the channels and as there is no need to pump out water. The scheme will be resumed from January after the canals are closed to enable cultivation of summer cotton, groundnut, ragi, cholam, gingelly and sesbania.

The work on the River Pumping Scheme at Killithur was resumed on 11th February 1954 to supply water for the summer cultivation of cotton, groundnut, ragi, cholam, gingelly, sugarcane, sesbania and Pillipesara and for the raising of paddy nursery. An area of 120 acres 76 cents was cultivated. The yield from the crops is as follows :—

Groundnut	6,500 lb.
Gingelly	4,300 lb.
Sugarcane	Crop is still on the field.
Cholam	4,500 lb.
Cotton	6,000 lb.
Sesbania	1,680,000 lb.
Pillipesara	21,000 lb.
Paddy nursery	11 acres.

Due to heavy down pour after sowing in the first week of March and due to intermittent rains thereafter the garden land crops of groundnut and ragi especially received a set back with the result that a fair percentage of plants died due to rotting. Water was supplied from 7th June 1954 for raising kuruvai paddy nursery and sesbania nursery in order to push up early raising of kuruvai paddy as soon as water is let in the channels.

IX. *Boring sets.*—The two departmental small power boring sets purchased from Messrs. Farm Equipment Company, Coimbatore, continued to work at the Agricultural Research Stations. There was no change in the policy of ear-marking of 75 per cent of the hand-boring sets and power drills of the Industries department exclusively for agricultural purposes except that the sets were utilized for other purposes when there was no demand for the same for the agricultural purposes. Government have been addressed for sanction for the issue of takkavi loans to ryots to meet the hire charges for the use of boring sets and power drills.

X. *Artesian wells.*—Detailed sketches for 101 artesian wells sunk in South Arcot district were drawn up indicating the fields served and the drainage facilities required. It has been suggested that a planned drainage be prescribed for this area for the maximum utilization of the artesian waters.

XI. *Pipes.*—There was very slow progress in the sale of pipes. There was no great demand from any of the departments. Government then ordered that sealed tenders might be called for, for the sale of pipes at the highest rates after giving wide publicity. Before doing this, the Government departments were once again addressed to send their indents so that their requirements might be met with before the stocks were disposed of by inviting tenders. Most of the departments did not send their indents and some declined to take on the plea that rates charged for the supplies made were at the book value and that the above rates were too high when compared to the prevailing

market rates and that they had not the requisite provision in their budgets to meet the increased cost. Government were thereupon addressed to permit the sale of the pipes to the other Government departments at the current market rates also and Government agreed to the above. The heads of departments were intimated of the revised orders of Government and they have been asked to intimate the requirements. Reports are being received and their requirements are met with when asked for.

In the meantime, an advertisement was issued in the dailies calling for sealed tenders for the sale of the pipes stocked in the depots at the highest price. The District Forest Officers were also asked to give wide publicity in this direction and to call for sealed tenders. The tenders offered for the purchase of pipes were very low in the districts of North Malabar, South Kanara, South Malabar, South Arcot, North Arcot, Tanjore, Tirunelveli, Ootacamund and Pattukkottai and no tenders were received in the districts of Madurai, Ramanathapuram and Salem. In view of the very low tenders they were rejected and the officers were asked to await further instructions and to meet in the meanwhile the requirements of the Government departments. Further steps will be taken for disposal of the pipes after watching the progress of sale of pipes to the other Government departments.

Getting new agricultural service connexion for electric motor pumpsets was comparatively easy. There was no case of an electric motor pumpset not being installed for want of pipes from the department.

XII. *M.B. shed.*—The M.B. sheds were being regularly used for the storage of departmental seeds, manures, implements, machinery and other purposes. The M.B. shed at Sattur has been electrified during the period under report. The M.B. sheds belonging to the Ex-Servicemen Co-operative Society, Madurai, were purchased on the sanction of Government for locating the office of the Assistant Agricultural Engineer (Inspection), Madurai, and for the storage of agricultural machinery and implements and for running a regular workshop to attend to sick units. Proposals are being put up separately for erection of workshop machineries for improving the tractor service facilities in this district.

XIII. *Motor vehicles.*—On 1st October 1953 after partition of the province the number of motor vehicles under this department in the Residuary State is as follows :—

Lorries	24	Station wagons	2
Jeeps	24	Jeep trailers	11
Buses	2		

One lorry MSC 9576 has been received from the Civil Supplies department in the place of the condemned lorry MDV 1103. One jeep trailer was also received from the Civil Supplies department and this was sent to the District Agricultural Officer, Sattur. The Government sanctioned the transfer of one jeep from Civil Supplies department for the use of the Assistant Agricultural Engineer, Soil Conservation Scheme, Dharapuram, in connexion with the soil conservation scheme. The tyres and tubes for the motor vehicles were purchased as usual under the Rate Contract System. Steps were taken to maintain the vehicles in good condition by undertaking repairs then and there as recommended by the Area Transport Officer.

According to the rates fixed by Government for the division of assets and liabilities there are surplus lorries in the Andhra State. The matter is under consideration of Government regarding the reasonability of the allocation

of valuable movable stores, like lorries, jeeps, etc., of the different departments in the Composite Madras State among the Andhra, Mysore and Residuary States.

XIV. *Iron and steel.*—The departmental activities which originally started with State Trading in iron and steel are now confined to the *only one item* of placing quarterly indents for *iron and steel* for agricultural purposes in consultation with the State Steel Advisory Board.

The acquisition and distribution of iron and steel under the State Agricultural Quota were being done by the co-operative societies in this State from the middle of 1950 up to the third quarter of 1953.

In the third quarter of 1953, Government ordered that the retail distribution of iron and steel for agricultural purposes be transferred from the select co-operative societies and entrusted to the registered stock-holders of this State, who should distribute the stocks in accordance with the prices fixed by the Iron and Steel Controller, Calcutta. This system is now in vogue.

An *ad hoc* allotment of scrap iron and defectives is being made every quarter for exclusive allotment to the fabricators of this department through the two departmental controlled stockists at Madras and Tuticorin for manufacture of suitable agricultural implements. A quantity of T. 1,126-13-2-8 of defectives was received and allotted to the fabricators of this department during the period for manufacture of suitable agricultural implements. The details of allotments of iron and steel made for agricultural purposes during the period of nine months (1st October 1953 to 30th June 1954) are as under :—

	T.	C.	Q.	LB.
Standard steel	1,977	11	0	20
Non-standard steel	1,126	13	2	8

The disposal of slow moving and unwanted stocks of iron and steel still remaining with the department is being liquidated in all the districts by the District Agricultural Officers by calling for sealed tenders according to the instructions contained in G.O. Ms. No. 159, Agriculture (Food Production), dated 14th May 1954.

3. *Implements and machinery.*—Besides supplying implements and machines to agriculturists, investigations on the suitability of agricultural machinery designed in other countries were carried out. A brief note on machinery tested is given in Appendix.

XX. SPECIAL PROBLEMS, PROGRAMMES AND WORK DONE IN THE DISTRICTS.

North Arcot.—Cotton is a minor crop in the district. However due to departmental propaganda 200 acres of H. 420 and 1,610 acres of P. 216 F. cottons were grown. Forty-two demonstration plots were laid and 910 acres of paddy were brought under the Japanese method of paddy cultivation. Sesbania seedlings were planted in 52,400 acres and 53 tons of improved paddy seeds were distributed to cover 2,402 acres.

South Arcot.—Improved paddy seeds to the extent of 81 tons to cover 3,331 acres were distributed. Besides 2,080 acres of green manure seeds to cover 88,477 acres and 172 maunds of cotton seeds to cover 3,711 acre pure and 3,565 acre mixed crops were also distributed. Agricultural associations have been formed practically in all the villages in the district. There is a concentrated area under sugarcane in the district and a special staff attended to the extension work in this crop.

Chingleput.—Due to the functioning of the intensive cultivation scheme, it has been estimated that 12,950 tons was added to the production of foodgrains in the district. Sixty-two filter points sunk have brought in about 620 acres under paddy additionally. Ten tons of green manure seeds to cover 890 acres was distributed and 18 tons of improved paddy seeds covered 865 acres. Cotton cultivation was introduced over 830 acres. Modified Japanese method of paddy cultivation was demonstrated in 88 centres. In the *Madras City* 548 lb. of vegetable seeds, 18,500 vegetable seedlings, 603 (numbers) fruit plants, 9,756 (numbers) of other economic plants and 14,607 (numbers) of glyricidia seedlings and cuttings were distributed to the public.

Salem.—Sesbania on border crop was planted in 565 acres for seed purposes and 25,800 acres for green manuring. Glyricidia was planted in 1,350 acres. Japanese method of paddy planting was adopted over 2,000 acres P. 216 F. cotton was introduced as a mixed crop with ragi and groundnut over 400 acres. M.C.U. 1 cotton seeds were distributed to cover over 6,000 acres. Twenty-six thousand fruit plants and 6,500 selected coconut seedlings were distributed. Tractors were used for ploughing 645 acres and levelling 220 acres. A special Plant protection assistant was engaged for the control of wilt of betel vine and 50 acres were treated.

Coimbatore.—Sesbania seedlings as border crop for green manure occupied 15,611 acres. Glyricidia was planted to cover 4,815 acres. Improved paddy seeds to the extent of 1,079 bags and millets seeds to the tune of 406 bags to cover 5,209 and 9,320 acres, respectively, were distributed. Soil conservation work was attended to and 163 acres were terraced, 1,907 acres contour-bunded, 1,164 acres levelled, 1,162 acres bunded with bund former and 871 acres were cultivated along contours. Strip cropping was practised over 205 acres.

Tiruchirappalli.—As against a target of 60 filter point tube wells 77 were sunk. Paddy seeds to the extent of 603 bags to cover 2,411 acres and green manure seeds to the extent of 13,569 lb. to cover 73,174 acres were distributed. Due to the working of all intensive cultivation schemes in the district 15,008 tons of foodgrains were estimated to have been produced additionally.

Tanjore.—About 192 tons of green manure seeds to cover 28,957 acres and 26¾ tons of improved paddy seeds to cover 1,340 acres and 300 maunds of cotton seeds to cover 547 acres of rice fallows were distributed. As a result of the working of all the intensive cultivation schemes 6,657 tons of foodgrains were estimated to have been additionally produced. Tractor ploughing and harrowing was done in 2,480 acres, levelling was done over 22 acres.

Pattukkottai.—Six hundred and eight tons of improved paddy seeds to cover 27,405 acres and 18½ tons to cover 12,685 acres were distributed. Vegetable seeds to the extent of 313 lb. were sold. Sesbania seedlings along borders were planted over 22,010 acres and pillipesara was grown over 17,817 acres. Cotton was grown as pure crop in 50 acres and as mixed crop over 237 acres.

Madurai.—One hundred tons of improved paddy seeds to cover 3,760 acres, 13 tons of millets seeds to cover 2,032 acres and 1 ton of green manure seeds to cover 80 acres were distributed. Besides sesbania as border crop was adopted in 27,934 acres, paddy cultivation by the Japanese method was demonstrated in 621 centres. Forty-five filter point tube wells were sunk.

Ramanathapuram.—There is much scope for reclamation of cultivable waste lands for which subsidy may be necessary. Eighty-four filter points were sunk and the taluks of Sivaganga and Paramakudi benefited by these

departmental tractors ploughed 1,518 acres. Sixty-six tons of improved seeds were distributed to cover 6,898 acres. M.C. 1 cotton seeds to the extent of 2,511 maunds to cover 11,037 acres were distributed.

Tirunelveli.—Sesbania as border crop was adopted over 7,586 acres. About 40 tons of improved paddy seeds to cover 1,640 acres was distributed. Improved cotton seeds to the extent of 1,658 maunds were sold and these covered an area of 4,975 acres. Japanese method of paddy cultivation was popularized.

North Malabar.—Over 595 tons of paddy seeds to cover 16,440 acres were distributed. Sesbania as border crop was adopted over 16,841 acres. Two hundred and sixty-five pounds of vegetable seeds were distributed. Control measures were adopted successfully against the armyworm, caseworm, grasshoppers, rice bug and fulgorids, infesting the paddy crop.

South Malabar.—Over 72 tons of paddy seeds were distributed to cover about 5,230 acres. Sesbania as border crop was grown over 20,158 acres. Soil conservation measures were demonstrated by terracing 428 acres, levelling 305 acres, contour-bunding 209 acres and putting up bunds over 1,108 acres.

South Kanara.—Sesbania as border crop was planted over 4,498 acres. Over 153 tons of paddy seeds were distributed to cover 6,894 acres. Proper soil conservation measures were demonstrated by terracing over 71 acres and levelling 323 acres and putting up field embankments over 66 acres. Campaign for treatment against arecanut 'Mahali' disease was carried out in 800 acres. Jassids, hispa and rice bugs occurring over 2,143 acres were treated with pesticides and controlled.

The Nilgiris.—Through tractors 121·5 acres were ploughed up and 74·75 acres were levelled. Thengumurhada Co-operative Farming Society was supplied with 1,410 lb. of improved paddy seeds and 794 lb. of green manure seeds and a maistry was posted for work in the society's lands. In potatoes 50 acres of seed farms were arranged and 100 bags were procured. About 140 lb. of vegetable seeds were sold. Soil conservation measures of terracing over 310 acres, contour-bunding over 100 acres and contour-cultivation over 100 acres were adopted. The scheme for the welfare of Todas was continued and 584 bags of potatoes with an equal quantity of manure mixture were advanced for cultivation purposes. In the district 550 bee colonies are estimated as functioning producing each about 12 lb. of honey.

XXI. FINANCE.

The receipts and expenditure for the financial year 1953–54 and the corresponding figures for the previous year are given below :—

	1952–53.	1953–54.	1st April 1953 to 30th September 1953 Composite State.	1st October 1953 to 30th June 1954 Residuary State.
	IN LAKHS.	IN LAKHS.		
1. Expenditure—				
40. Agriculture	261·76	174·02	115·0	59·2
2. Receipts—XXIX. Agriculture	135·28	102·14	71·0	31·14

Loans.—The following loans were distributed during the nine months period :—

3. Takkavi loan (according to fasli year)—

(i) For improved seeds and manures	Composite State	..	5·00
	Residuary State	..	9·26
	Total	..	14·26
(ii) For agricultural implements	Composite State	..	0·02
	Residuary State	..	0·10
	Total	..	0·12
(iii) For intensive manure scheme	Composite State	..	67·0
	Residuary State	..	40·0
	Total	..	107·0

1. *Expenditure.*—There has been an overall decrease of expenditure amounting to 87·74 lakhs during the year under report. The decrease is mainly due to (i) the separation of the Andhra State in the middle of the year, (ii) postponement of purchase of machinery, equipment for want of Government's sanction in time, (iii) general restrictions in the indents for spare parts under " 40. f. Engineering " and (iv) economy and small savings under other items.

2. *Receipts.*—The decrease from the previous year's figure is due to separation of Andhra State and non-collection of recoveries due from parties during the year under report.

3. *Loans.*—An appreciable increase is found in the loans sanctioned for the purchase of chemical fertilizers under intensive manuring scheme. There is a fall in the amount of loans sanctioned for the purchase of seeds and manures and implements. This is due to the separation of the Andhra State. The increase under intensive manure scheme is due to increased provision for loans and large part disbursed in the Andhra districts before partition.

XXII. SALIENT FEATURES OF WORK DONE AND OUTSTANDING ACHIEVEMENTS DURING THE YEAR 1953–54 FROM 1ST OCTOBER 1953 TO 30TH JUNE 1954.

Season.—After a succession of six deficit years of rainfall, the seasonal rains improved and crops were found to be normal in general and even above normal in certain regions.

Intensive Cultivation Schemes (Five-Year Plan).—During the third year of operation of the intensive cultivation schemes under the First Five-Year National Plan and Agricultural Schemes are estimated to have contributed to an additional production of 231,419 tons of foodgrains. Besides 16,255 tons have also been estimated as having been saved from loss through the timely action taken by the Plant Protection Staff against pest and diseases affecting crops.

Community Projects.—Besides providing the agricultural staff required for these projects, the department arranged for supplies of improved seeds for these areas. Programme of work on the agricultural aspects were approved this by department.

National Extension Service.—Technical help was given by the officers of the Agricultural department in National Extension blocks. The basic Agricultural training schools have been provided with Agricultural Officers as Principals. In the Tanjore Development Scheme, an Agricultural Officer for every revenue division, one Agricultural Demonstrator for every firka and a demonstration maistry for every 5,000 acres of paddy was proposed and the scheme was inaugurated in Mayuram and Kumbakonam revenue divisions. The object is to increase the exportable surplus of Tanjore rice by 75,000 tons in the course of three years through green manuring with sesbania, high yielding blast resistant strains of paddy and fertilizer application.

Cotton Extension Plan.—During the third year of operation of the Cotton Extension Scheme under the Five-Year National Plan in the Residuary State, an area of 20,582 acres and production of 17,856 bales as against 42,296 acres and 43,318 bales of cotton targetted, was estimated to have been achieved.

Research—Agricultural Chemistry.—Chemical analysis of 1,898 samples of soils, plant materials, manures, foods, waters, etc., was done and advice given whenever needed. A rapid and reliable method of estimation of phosphoric acid was standardized in connexion with rapid tests for soils. In laterite soils application of phosphatic manures supplemented with 7,500 lb. of green manures and 3,000 lb. lime per acre gave good crop production. Krilium a soil conditioner which was found to improve the physical condition of heavy day soils in foreign countries, was found useful here also but was not economic at its present price. Pig dung as starter was found to produce good compost.

Agricultural Entomology.—That the incidence of paddy stem-borer pest could be greatly controlled by two to three rounds of spraying with Folidol at 0·25 per cent strength was noted during the year in the pest control trials at Agricultural Research Station, Aduthurai. Similarly Folidol and Exatox spraying greatly reduced the incidence of spotted boll worms on cotton and gave increased yields mixing of synthetic chemicals Lindane at 1 : 100 and Geigy 33 at 1 : 500 with seeds, kept off stored products pests from over one year. Folidol spray at 0·025 per cent Aldrin and Dieldrin sprays 0·1 per cent did not cause any phytocidal effect in cucurbits which are easily affected by DDT and BHC.

Agricultural Mycology.—One Paddy culture 6,538 and Kirubilia were found resistant to blast in the trials for evolution of blast resistant strains at Coimbatore. In Cumbu one culture 814/3 was found highly resistant to smut and is being multiplied. Two selections from 2196 continued to exhibit resistance to Black arm of cotton. Seed treatment with organo mercury compounds were found to effectively control seed borne infection. Spraying with copper and mercury fungicides reduced secondary infection and gave increased yields.

Agricultural Meteorology.—Crop weather data as per programme were collected for future use in collaboration between weather conditions and crop behaviour.

Crops—Paddy.—Five cultures Halluga 1828, Kanwa 1958 of thirkraya 2483 and Maskaty 3159 which have given 10—20 per cent over local varieties are ready for general release as strains. These may serve the needs of over 2 lakhs of paddy area.

Further six cultures from hybrid progenies are ready for district trials next year.

Manurial experiments confirmed the previous trials that phosphates applied along with green manures become more easily available to paddy crops and showed increase in yields.

Millets and pulses.—Three ragi strains Co. 5, Co. 6 and Co. 7 were released and these are expected to cover 30,000 acres giving 5,030 tons of additional grain. One strain of Pani varagu was released as Co. 1 and it is capable of spreading over 1,000 acres. Horsegram selection No. 35 was found promising in district trials.

Oil seeds.—Groundnut strain AH. 6481 a dormant bunch strain, was found to do well in Coimbatore district giving over 11 per cent increased yield over local and is being multiplied for supply in Pollachi area. In the rotation experiments millets following groundnuts were found to yield better than when they follow millets, giving increases of 20—46 per cent. Soaking kernels of spreading groundnut with Ethylene Chlorhydrin (0·7 per cent) and dichlorophenoxy acetic acid (50 PPH) gave the highest germination and therefore were useful in breaking the dormancy in groundnuts. In gingelly early sowings of the summer crop in February was found to be better. In castor, plants with dark green leaves were found to be less susceptible to castor semilooperpest. From the Government coconut nurseries 52,263 quality coconut seedlings were distributed.

Cotton.—The superiority of culture 9030 over MCU. 1 with increase in the yield of lint by 8 per cent was established. For the unirrigated areas in Coimbatore, Salem, Madurai and Tiruchirappalli culture 9030-8-5 was found better than even MCU. 2. In unirrigated Tinnevellies, cultures 6186 and 6876 were found promising and one of these is likely to replace the existing strain K. 5.

Sugarcane.—Co. 467 was found to yield over 40 tons with 5 ton CCS per acre and was therefore released for distribution in Pugalur factory area as it was found to be free from smut disease also.

Horticulture.—In Citrus root stock trials Jamberi was found to produce maximum growth of Mandarin scions. Spraying with Sandolin A induced early blossoming and higher yield in apples. In the vegetative propagation trials in cashewnuts, cincturing was newly determined to be of promise in rooting of shoots. Layering was also successful. In vegetables two bendi selections were found to be higher yielders. A scheme for research in vegetables was sanctioned and preliminary steps were taken to start the work.

The Cardamom Scheme was closed and promising materials were sent to Burliar for future work in Anamalais. Dusting with antoxone at 1 : 500 strength was found to control Cardamom thrips effectively. In pepper it was newly determined that varieties of pepper could be inarched on each other and on wild types. Spraying with 2.4.D at a strength of 20 PPM was found to reduce spike shedding.

In Bananas eight new varieties were added to the varietal collections. Six thousand one hundred and eighty-seven suckers from 81 varieties were sold to the public.

Systematic Botany.—Survey and compilation of flora of Ramanathapuram, Tirunelveli and Coimbatore were in progress.

Among several fodder legumes tried, Desmodium tortuosum and Phaseolus semi-erections were found to do well and are to be multiplied for further trials in Agricultural Research Stations.

Plant Physiology.—In seed viability studies with tetrazolium chloide dehusking of paddy seeds was found necessary with dormant varieties. Weed control studies with chemical herbicides indicate complete and permanent eradication with a single spray of hormone chemical at a dose of 2 to 4 lb. per acre while with grass weeds spraying has to be repeated to prevent regrowth from underground stolons.

Cytogenetics.—Determination of Chronosome numbers in Bananas and Cytological investigations into the hybrids of paddy, sorghum and cumbu were carried out.

Agricultural Engineering (Research).—A cheap bullock operated pump employing two plunger type pump units drawn by a pair of bullocks for use in open wells and tube wells, was designed and manufactured.

Rotary weeders of the Japanese model were manufactured for trials in Agricultural Research Stations. A power operated paddy thresher of the Japanese model was also manufactured. Manual, bullock and tractor operated machinery for cultivation of groundnut were designed, manufactured and are undergoing tests.

Agricultural Research Station.—Due to the drive given for reduction of expenditure and increase of receipts in the Agricultural Research Stations in the State there was a reduction in expenditure by Rs. 66,630 and increase in receipts of Rs. 1,22,516 or a net saving of Rs. 1,91,140.

Crop-cutting experiments.—From the crop-cutting experiments conducted on paddy during the year, the average yields of rice for the State as a whole in respect of first, second and third crops, work out to 992·81 lb. per acre, 1,008·18 lb. per acre and 1,206·54 lb. per acre, respectively.

The rate of response due to the application of Grow More Food aids—Improved seed sesbania and ammonium sulphate—was respectively 193·34, 179·85 and 250·75 lb. additional yield of rice per acre.

Wynaad Colonization Scheme.—A small scale fruit preservation unit was set up and preliminary tests indicated great scope for this work in this colony.

Extension work.—Over 2,975 demonstration plots were laid and 16,000 agricultural associations were found for 21,000 villages in the residuary State. The following quantities of improved seeds and plants were distributed :—

Paddy seeds	1,395 tons.	Coconut seedlings	52,263 Nos.
Millets	47 ,,	Fruit plants	230,162 ,,
Pulses	210 lb.	Vegetable seeds	1,469 lb.
Cotton	1,088 tons.	Seedlings	18,500 Nos.
Groundnut pods	93,080 lb.		
Kernels	1,140 ,,		
Castor	1,500 ,,		
Gingelly	1,900 ,,		

Over 66,610 tons of rural compost was estimated to have been made in villages and 905,158 acres of paddy land was put to Sesbania as a border green manure. To supplement bulky manures 44,330 tons of ammonium sulphate and 1,374 tons of phosphatic manures were arranged for distribution and loans to the extent of forty lakhs were given to small cultivators to enable them to purchase the fertilizers.

Agricultural marketing.—A report on the marketing of peas, french beans and tomatoes in the State was prepared. The materials for the market surveys on oilseeds, cereals, pulses and spices were made up-to-date.

Grading of ghee, eggs, mangoes, potatoes, etc., was pushed up and in all Rs. 11·09 lakhs worth of Agmark produce was graded.

Regulated markets established for cotton, groundnut, gingelly, coconut, arecanut and tobacco covered an area of 2,517,672 acres out of 3,986,463 acres under these crops in the State. The work was however complicated by the

action of some traders challenging the validity of the Madras Commercial Crops Markets Act. Necessary action is being taken to amend the Act and rules with reference to the decisions given by the District and High Courts of the State. However good work was continued to be done by the South Arcot Market Committee through eight regulated markets. Coimbatore Market Committee opened two more markets at Gobichettipalayam and Pollachi. The North Arcot Market Committee opened markets at Vellore and Tiruvannamalai. The Tirunelveli Market Committee opened a market at Koilpatti. A review of price conditions in the State reveals a gradual downward movement in prices of agricultural commodities which may lead to a slump in the course of 2 or 3 years and there is already a demand for stabilization of prices at economic level.

Soil conservation.—The pilot scheme of soil conservation in Ketti Valley in Nilgiris proved a success. Potatoes grown in the protected areas were noted to have given 40 per cent more yields than crops in the unprotectd areas.

In the Dharapuram taluk of Coimbatore district 708 acres were contour bunded as a famine relief measure.

Agricultural engineering.—There were 85 tractors and 74 bulldozers for hire in the Residuary State and these tackled an area of 16,635 acres leading to the additional production of 1,481 tons of foodgrains. Twenty-three tractors with matched implements were supplied on the hire-purchase system.

Four hundred and forty oil engine pumpsets were supplied on hire for irrigation purposes. A river pumping scheme at Talanjeri in Mayavaram taluk in Tanjore district was started newly.

Five hundred and twenty-five filter point tube wells were sunk and provided with oil engine for lifting water. These are expected to provide irrigation for 5,250 acres and produce about 2,625 tons of foodgrains additionally.

General.—In many respects, the year 1953–54, was a record for food production. The application of ammonium sulphate reached a record figures of 66,950 tons, and the area under sesbania 9 lakhs. Conditions were also favourable for the expansion of improved strains. Work as plant protection was done on a large scale, and the issue of weekly forecasts was a useful step. The introduction of village seed farms is a special feature likely to have large extension in the villages. The Tanjore Extension Scheme is also a special feature intensifying all agricultural improvements in a concentrated manner in selected divisions. With the removal of trading schemes and distribution of fertilizers from the agricultural staff, the state is set for more extensive work on the field and achievements of all targets under the Five-Year Plan.

M. S. SIVARAMAN,
Director of Agriculture.

APPENDIX 1.

Rainfall statement (districtwise) for the Madras Residuary State from 1st October 1953 to 30th June 1954.

(1) Name of the district.	October 1953. (2)		November 1953. (3)		December 1953. (4)		January 1954. (5)		February 1954. (6)	
	Average.	Actuals.	Average.	Actuals.	Average.	Actuals.	Average.	Actuals.	Average.	Actuals.
Chingleput	10·2	15·6	12·1	4·7	4·6	1·2	1·3	1·7	0·5	..
Madras	..	21·8	..	4·9	..	1·3	..	1·1	..	..
South Arcot	8·9	10·8	10·9	4·0	5·4	1·2	1·7	3·8	0·6	0·1
North Arcot	6·5	12·3	6·4	1·5	2·3	0·2	0·9	1·9	0·3	..
Salem	6·1	13·2	4·0	1·3	1·2	..	0·4	1·2	0·3	0·1
Coimbatore	6·6	3·4	4·4	2·0	1·4	0·2	0·5	2·0	0·4	0·1
Tiruchirappalli	7·1	11·4	5·9	3·1	2·7	0·4	1·0	2·7	0·4	..
Tanjore	8·2	9·2	11·6	9·0	6·9	3·0	2·2	3·6	0·7	0·1
Madurai	7·3	11·9	6·1	3·2	2·3	0·7	1·0	3·8	0·6	0·2
Ramanathapuram	7·1	8·9	7·1	7·2	3·5	1·3	1·5	5·0	0·8	..
Tirunelveli	6·7	5·4	7·9	7·8	3·4	0·8	1·8	4·6	1·2	0·3
Malabar	10·6	14·7	5·4	1·3	1·0	..	0·3	0·4	0·3	..
South Kanara	9·2	13·7	3·2	0·2	0·6	..	0·2	0·7	0·1	..
The Nilgiris	10·0	14·4	6·9	1·4	2·6	0·5	0·3	3·0	1·0	0·5

(1) Name of the district.	March 1954. (7)		April 1954. (8)		May 1954. (9)		June 1954. (10)	
	Average.	Actuals.	Average.	Actuals.	Average.	Actuals.	Average.	Actuals.
Chingleput	0·4	1·2	0·6	0·4	1·4	0·1	2·0	1·6
Madras	..	..	..	..	..	0·2	..	0·1
South Arcot	0·5	4·0	1·1	..	1·9	0·9	1·8	1·0
North Arcot	0·4	1·0	0·9	0·5	2·6	2·9	2·4	1·4
Salem	0·5	0·8	1·7	1·1	4·1	5·1	2·2	1·3
Coimbatore	0·7	1·7	2·1	..	3·4	..	1·4	0·5
Tiruchirappalli	0·5	0·9	1·7	..	3·3	..	1·4	..
Tanjore	0·7	2·7	1·5	2·7	2·0	..	1·4	0·7
Madurai	0·8	1·1	2·4	..	2·9	3·5	1·3	0·7
Ramanathapuram	0·9	3·3	2·1	..	2·0	..	0·9	0·3
Tirunelveli	1·5	5·9	2·1	1·7	1·4	1·4	0·8	0·1
Malabar	0·8	1·6	3·4	4·3	8·1	5·8	30·4	40·1
South Kanara	0·2	1·1	1·6	3·8	5·9	4·8	39·8	53·0
The Nilgiris	1·4	2·8	3·6	4·2	6·0	4·6	9·4	7·6

N.B.—The average for the year 1952–53 has been adopted for 1953–54.

APPENDIX 2.

Statement showing the varieties of seeds and quantities multiplied in the seed multiplication scheme for the period from 1st October 1953 to 30th June 1954.

Serial number and name of the seed.	Quantity obtained from Nucleus (i.e.) from Agricultural Research Station.		Quantity obtained from Seed Farms.		Quantity obtained from Non-seed Farms.		Quantity sold.	
	TONS.	LB.	TONS.	LB.	TONS.	LB.	TONS.	LB.
1 Paddy seeds	94	1,713	1,091	138	28	1,832	1,394	1,938
2 Millets	4	223	17	1,437	..	..	47	797
3 Pulses	0	432	0	200	0	230	0	210

Statement showing the varieties of seeds and quantitiee multiplied in the seed multiplication scheme for the period from 1st October 1953 to 30th June 1954—cont.

Serial number and name of the seed.	Quantity obtained from Nucleus (i.e.) from Agriculture Research Station.		Quantity obtained from Seed Farms.		Quantity obtained from Non-seed Farms.		Quantity sold.	
	TONS.	LB.	TONS.	LB.	TONS.	LB.	TONS.	LB.
Millets details—								
Cholam	1	443	1	1,529	..		25	1,695
Cumbu	1	1,225	11	99	..		10	1,090
Ragi	1	657	4	1,439	..		10	1,234
Tenai	0	138	0	610	..		0	1,258
Total ..	4	223	17	1,437	..		47	797
Pulses details—								
Bengalgram	0	292	0	150	..		0	74
Redgram	0	140	0	50	0	230	0	136
Total ..	0	432	0	200	0	230	0	210

Appendix 3.

Statement showing the production and distribution of compost in the Residuary Madras State (1st October 1953).

Serial number and month.	Number of municipalities and panchayats from which returns received.		Quantity of compost prepared in tons.	Quantity of compost sold in tons.
	Municipalities.	Panchayats.		
1 October 1953	60	210	19,833	7,019
2 November 1953	60	217	20,843	7,251
3 December 1953	59	210	21,613	19,851
4 January 1954	60	217	21,543	11,560
5 February 1954	59	217	21,820	18,138
6 March 1954	58	209	20,437	24,266
7 April 1954	60	209	21,276	15,621
8 May 1954	60	209	21,402	29,636
9 June 1954	59	219	21,348	31,248
Total ..			189,665	164,590

Appendix 4.

Statement showing the progress of grading work during 1st October 1953 to 30th June 1954.

Serial number and name of the packer.	Centre.	Quantity.	Value.	Quantity.	Eggs (in numbers) 1953-54 (1st October 1953 to 30th June 1954)' Value.
(1)	(2)	(3)	(4)	(5)	(6)
			RS.		RS.
1 Messrs. Eggs and Poultry Mart.	Madras.	422,069	54,715	283,309	26,504
2 Messrs. M. M. Ebrahim Bros.	Do.	10,255	1,024	455,257	50,517
3 Sri M. Rajoo Chettiar ..	Do.	2,125	267	1,193	150
4 K. N. Govindaswami Pillai.	Do.	Discontinued from September.		11,221	1,379
5 O. S. Syed Mohammed ..	Do.	..	..	..	..
6 P. P. Samual	Do.	Certificate of authorization was issued to these parties during 1954 and they have not yet started grading.			
7 K. Venkatarayalu ..	Do.				
8 P. Parameswara Kurup..	Do.				
9 G. Singaravelu Thevar ..	Tiruchirappalli.				
10 V. C. Inasu..	Ootacamund.	7,254	895	10,551	1,297
11 Egg Co-operative Marketing Society.	Katpadi.	91,242	11,270	139,145	17,227
Total ..		532,945	68,171	900,676	107,074

Ghee in maunds.

		MDS.	SRS.	RS.	MDS.	SRS.	RS.
12 Messrs. Amarchand Gulabchand.	Tiruppur ..	3,215	4	517,891	5,182	26	897,300
13 Messrs. Dhanalakshmi & Co.	Do. ..	2,649	24	452,931	3,599	32	643,682
14 Messrs. A. S. Arunachalam.	Madurai ..	226	24	36,888	277	8	46,645
15 Messrs. Lingam & Co. ..	Coimbatore.	..		..	43·8		8,208
16 Messrs. T. M. L. Angappa Chettiar.*	Kangayam.	212	16	34,040	..		..
Total ..		6,301	26	10,41,750	9,102	34	15,95,836

* From May 1954

APPENDIX 5.

National Extension Service blocks set up in 1953–54.

Name of the district.	Name of block.	Headquarters.	Nunber of villages.	Area in square miles.	Population.
(1)	(2)	(3)	(4)	(5)	(6)
North Arcot ..	Kalasapakkam ..	Polur	53	98·26	74,301
	Tiruvannamalai.	Tiruvannamalai.	100	170,50	118,311
South Arcot ..	Panrutti	Panrutti	81	183·00	95,574
	Kurinjipadi ..	Kurinjipadi ..	71	157·40	99·859
	Chinnasalem ..	Chinnasalem ..	92	200·00	124,327
Chingleput ..	Tiruvellore ..	Tiruvellore ..	102	139·60	107,414
	Kadambathur ..	Kadambathur ..	106	117·61	91·424
Coimbatore ..	Tiruppur ..	Tiruppur ..	48	217·72	138,323
	Kangay. m ..	Kangayam ..	41	315·65	105,534
South Kanara ..	Manjeshwar ..	Manjeshwar ..	56	202·27	129,815
	Sullia	Sullia	41	315·65	105,534
Madurai	Tirumangalam ..	Tirumangalam ..	112	217·00	122,195
	Kallupatti ..	Kallupatti ..	108	332·00	133,996
	Usilampatti ..	Usilampatti ..	54	164·00	118,274
Malabar	Tellicherry ..	Tellicherry ..	48	477·80	336,706
	Payyanur ..	Payyanur ..	25	277·10	148,851
Nilgiris	Kundah	Ootacamund ..	29	684·10	103,115
Ramanathapuram.	Srivilliputtur ..	Srivilliputtur ..	46	159·72	467,975
	Sivakasi	Slvakasi	43	192·70	81,424
Salem	Krishnagiri ..	Krishnagiri ..	102	274·55	185,681
	Attur	Attur	55	239·00	134,357
Tanjore	Vedaranyam ..	Vedaranyam ..	40	133·66	110,582
	Tiruthuraipundi.	Tiruthuraipundi.	82	138·57	94·915
Tiruchirappalli ..	Musiri	Musiri	62	229·04	147,828
	Perambalur ..	Perambalur ..	30	192·00	76,442
	Karur	Karur	30	203·40	86,082
Tirunelveli ..	Sankarankoil ..	Sankarankoil ..	60	354·70	207,778
	Kurivikulam ..	Kurivikulam ..	66	280·00	111,367
		Total ..	1,783	6,668·53	3,479,993

APPENDIX 6.

List of new strains of millets released from 1*st October* 1953 *to* 30*th June* 1954 (*part of fasli* 1363).

Released in 1954.

*Ragi Co.*5.—An economic selection of Kurumsuruttai. It is suitable for South Arcot and portions of Salem, Coimbatore, North Malabar and South Kanara districts. Can be raised both under rainfed and irrigated conditions. Under rainfed conditions, it can be sown in June-July and under irrigation in the months of December and May. Duration 115 days. Grain yield 1,000 lb. per acre under rainfed conditions and 2,500-3,000 lb. per acre under irrigated conditions. Average height 4-4½ feet; pigmentations. Average height; Panicle, incurved.

Released in 1954.

Ragi Co. 6.—White Ragi (popularly known as Silver Streak). A slelection of hybrid origin with white grains and high protein content. Popularly grown on a restricted scale in many parts of the State due to its grain colour and high protein content. Suitable for cultivation under irrigation and is sown in December-January and May. Durarion, 120 days. Grain vied, 1,500 lb. to 2,000 lb. per acre. Average height, 3½ to 4 feet; Panicle shape, to curved.

List of new strains of millets released from 1*st October* 1953 *to* 30*th June* 1954 (*part of fasli* 1363)—cont.

Released in 1954.

Ragi Co. 7.—A short duration selection of ragi isolated from a collection from Cuddapah. It is suitable for portions of South Arcot, Coimbatore and South Kanara districts. This is generally sown irrigated in the months of December-January and May-June. Duration, 100 days. Grain yield, 2,500 to 2,800 lb. per acre. Average height, 2½ to 3 feet, Panicle shape incurved.

Panivaragu Co. 1.—A selection from Variga of Guntur origin, suitable for Tirunelveli, Madurai, Ramanathapuram and Salem districts. It is generally sown under irrigation in November, December, Duration, 90 days. Grain yield, 1,600 to 1,800 lb. per acre. Average height, 2 to 3 feet; grain colour, Buff yellow.

APPENDIX 7.

Cotton Extension Plan—Comparative statement showing the targets and achievements under area and production during 1952–53 *and* 1953–54.

Serial number and particulars.	Area in acres.				Production in bales.			
	1952–53.		1953–54.		1952–53.		1953–54.	
	Targets.	Achievements.	Targets.	Achievements.	Targets.	Achievements.	Targets.	Achievements.
I. Extensive cultivation—								
(a) By reclamation of waste and fallow land.	2,100	3,468	5,400	5,354	265	289	679	339
(b) By replacement of crops.	5,000	2,191	9,000	10,863	3,750	1,590	6,750	7,226
(c) Double cropping ..	13,800	9,546	13,700	4,524	5,548	3,034	6,200	1,841
II. Intensive cultivation—	..	..	..	..	..	..	..	..
(a) Irrigation	268,450	16,386	233,300	28,569	2,4965	917	22,640	3,851
(b) Inter cropping ..	50,400	4,281	36,000	11,168	6,300	741	4,500	1,995
(c) Application of fertilisers.	480,700	145,126	192,010	117,183	6,120	2,129	2,449	2,183
(d) Distribution of improved seeds.	18,000	4,049	12,000	3,694	1,500	1,299	1,000	341
(e) Control of pests and diseases.	2,000	15,762	2,000	6,416	100	188	100	80
(f) Improved cultivation methods.								
Total ..	37,395	10,480	42,296	20,582	47,048	10,187	43,318	17,856

NOTE.—In the above statement the total area includes in full items I (*a*) and (*b*), ½ of item I (*c*) and 1-10th of item II (*b*) and excludes items II (*c*) to (*f*). Total production excludes item II (*e*).

The money value of the increased production during the year is estimated to be about Rs. 71 lakhs at an avregae cost of Rs. 400 per bale of lint.

APPENDIX 8.

Review of Grow More Food achievements during 1953–54.

During the year 1953–54, a total extent of 12·89 lakhs acres was brought to beneficial use under all the Intensive Cultivation Schemes against a finalised target extent of 17·80 lakhs acres The additional production of cereals realised as verified l y the Revenue Officers, was 0·96 lakh tons against a finalised target of 1·46 lakhs tons based on the units of works and supplies actually achieved up to the end of March 1954. The gap between the finalised target and the verified figure of additional production is due to the fact that physical verification of achievements by filed inspection and enquiring by Revenue Officers can cover only a portion of and not the entire additional production resulting from the various Grow More Food aids distributed.

Appendix 9.

Intensive Cultivation Schemes—Supply schemes—Progress report for the period from 1st April 1953 to 30th June 1954.

Name of the scheme.	Number of units distributed as reported by Collectors from 1st April 1953 to 31st March 1954.	Total acreage to be covered by the quantity to be distributed.	Area achieved or benefited from 1st April 1953 till 30th June 1954 against distribution in column (2).	Additional production aimed at (in tons).	Additional production achieved as verified by the Collectors (in tons).
(1)	(2)	(3)	(4)	(5)	(6)
I. Distribution of fertilizers—					
A. Ammonium sulphate.	49,898	1,397,036	850,586	99,806	47,241
B. Phosphatic manures.	3,674	..	8,776	814	1,064
Total ..	53,572	1,397,036	859,362	100,620	48,305
II. Distribution of manures—					
A. Rural compost ..	61,940	13,385	10,428	1,550	1,032
B. Urban compost ..	87,433	17,589	18,803	2,286	1,302
B. Green manure seeds	544	46,943	214,457	4,265	21,303
Total ..	149,927	77,917	243,688	8,101	23,637
III. Distribution of improved seeds—					
A. Paddy seeds	3,908	183,080	125,117	12,217	6,971
B. Millet seeds	380	56,700	11,142	3,780	4,902
Total ..	4,288	239,780	137,259	15,997	11,873
Grand total ..	207,787	1,714,733	1,240,309	124,718	83,815
IV. Irrigation schemes—					
1. Pumping installations, oil engines and electric motors.	1,288	10,070	10,702	5,491	2,523
2. River pumping schemes.	7	800	132	518	42
3. Filter point tube wells.	312	3,280	1,734	1,277	100
V. Land development schemes—					
1. Soil conservation and contour bunding.	..	..	..	..	..
2. Clearance and reclamation of waste lands and old fallows with tractors.	..	27,193	17,139	3,612	1,267

(Data furnished by the Commissioner of Food Production.)

Appendix 10.

Intensive Cultivtion Schemes—Supply schemes—Progress report for the period 1st April 1953 to 30th June 1954—1954-55 Schemes (three months).

Name of the scheme.	Number of units achieved.		Acreage actually brought under cultivation.			
	Number of units aimed at as per programme for the year.	Total from 1st April 1954 to 30th June 1954.	Total acreage to be covered by the quantity to be distributed.	Total acres from 1st April 1954 to 30th June 1954.	Additional production to be achieved for the year (in tons).	Additional production acheved as verified by the Collectors (in tons).
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. Distribution of fertilizers—						
A. Ammonium sulphate ..	72,000	4,980	2,016,000	7,808	144,000	700
B. Phosphatic manure	..	..	..	..	..	..
Total ..	72,000	4,980	2,016,000	7,808	144,000	700
II. Distribution of manures—						
A. Rural compost	94,680	7,706	18,936	714	2,368	45
B. Urban compost	300,000	12,802	60,120	3,063	7,515	109
C. Green manure seeds	400	32	1,500,000	11,075	134,000	585
Total ..	395,080	20,540	1,579,056	14,852	143,883	689
III. Distribution of improved seeds—						
A. Paddy seeds	6,760	134	304,200	2,641	16,297	341
B. Millet seeds	548	17	81,339	2,019	5,439	61
Total ..	7,308	151	385,539	4,660	21,736	402
Grand total	474,988	25,671	3,980,595	27,320	309,619	1,791
IV. Land development schemes—						
1. Clearance and reclamation of waste lands and old fallows with tractors hiring scheme.	..	..	40,800	3,394	4,283	281
2. Lift irrigation schemes— Oil engines and electric motors.	448	97	10,313	784	5,157	104
3. Filter point tube wells ..	400	15	4,000	150	2,000	..

(Data furnished by the Commissioner of Food Production.)

APPENDIX II.

List of sugar factories in the Madras State which manufactured white sugar from sugarcane during 1953–54 crushing season.

Serial number and name of the factory.	Location.	District.	Average daily crushing capacity.	Actual crushing period during 1953–54 season. From.	To.	Total quantity of cane crushed tons.	Number of the licence granted under section 6 of the sugarcane Act.	Average sugar recovery percentage.	Grade or grades of Sugar manufactured. I.S.S.
(1)	(2)	(3)	(4) TONS.	(5)	(6)	(7)	(8)	(9)	(10)
1 The East India Distilleries and Sugar Factory, Limited, Nellikuppam.	Nellikuppam.	South Arcot.	1,700	21 Dec. 1953.	3 May 1954.	254,581	9	9·22	28 E.
2 The Madura Sugar and Allied Products, Limited, Pandiyarajapuram.	Pandiyarajapuram.	Madurai ..	300	15 Feb. 1954.	6 May 1954.	12,176	1	9·09	26E, 27 E, 28 E, 29 E and 13.
3 The Deccan Sugars and Abkari Company, Limited, Pugalur.	Pugalur ..	Tiruchirappalli.	750	1 Mar. 1954.	22 Apr. 1954.	33,064	10	9·11	Grade I.
4 The Murugappa Sugar Company, Limited, Mailpatti.	Mailpatti.	North Arcot.	..	The factory did not work during the 1953-54 crushing season.					

APPENDIX 12.

Statement I.

Figures of acreage and yield of food crops in the Residuary Madras State in 1953–54.

Crop.	Area (acres).	Yield (tons).	Remarks.
Cereals—			
Paddy	6,378,000	4,440,000	Figures of yield are in terms of unhusked grain.
Cholam	1,717,300	557,500	
Cumbu	1,402,000	347,700	
Ragi	918,000	428,100	
Korra	82,300	25,800	
Varagu	623,200	269,300	
Samai	490,400	94,600	
Maize	14,400	6,300	
Other cereals	207,000	47,250	
Total cereals ..	11,832,600	6,216,550	
Pulses—			
Greengram	127,100	12,600	Figures of yield are in terms of unhusked pulses.
Redgram	170,100	30,300	
Blackgram	141,000	18,100	
Bengalgram	6,400	1,200	
Horsegram	553,200	48,700	
Others	141,800	11,990	
Total pulses ..	11,39,600	122,890	

Figures of areage and yield of food crops in the Residuary, Madras State in 1953–54—cont..

Crop.	Area (acres).	Yield (tons).	Remarks
Sugars—			
Sugarcane	116,500	337,230 (Gur).	
Others	57,640	49,780	
Total sugars ..	174,140	387,010	
Condiments and spices—			
Chillies	130,900	70,000	
Ginger	15,250	5,440	
Pepper	118,650	9,010	
Others	235,560	30,460	
Total condiments and spices..	500,360	114,910	
Fruits and vegetables including root crops—			
Mangoes	97,280	261,940	
Plantains	133,820	864,070	
Onions	26,800	125,800	
Others	396,730	1,086,560	
Total ..	654,630	2,338,370	
Miscellaneous food crops ..	31,940	8,700	
Total food crops ..	14,333,270	9,188,430	

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 forecasts for 1953–54. Particulars in respect of other crops are only rough estimates.

(*b*) Figures of production of greengram, redgram and blackgram are furnished in terms of husked pulses in the final forecast reports. For purposes of this statement, these have been given in terms of unhusked pulses as in the case of other pulses for the sake of uniformity.

(*c*) 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 all pulses.

Statement II.

Figures of area under certain cereals in sugarcane and redgram in 1953–54.

Crop.	Composite Madras State (from 1st July to 30th September 1953).	Residuary Madras State (for the period from 1st October 1953 to 30th June 1954).
	ACS.	ACS.
Paddy	6,132,000	,5553,000
Cholam	2,225,300	970,100
Cumbu	1,604,700	702,500
Ragi	907,700	355,000
Korra	986,900	38,800
Varagu	401,800	344,900
Samai	284,000	286,100
Redgram	269,600	61,000
Sugarcane	186,460	27,100

APPENDIX 13.

Estimated area covered by improved strains of crops from 1953–54.

Name of crop	Total area under the crop in the State.	Area covered by improved strains (both by departmental distribution and by natural spread).	Percentage of spread.
	ACS.	ACS.	
Paddy	5,818,519	2,571,038	44·1
Cholam	1,756,000	246,782	14·1
Cumbu	1,173,000	334,599	28·5
Ragi	902,000	169,863	18·8
Tenai and minor millets	657,000	39,669	6·0
Redgram	149,000	10,139	6·8
Cotton	848,500	533,556	62·9
Groundnut	1,872,000	327,900	17·5
Gingelly	421,500	64,500	15·3
Castor	37,000	2,200	5·9
Sugarcane	119,000	113,050	95·0

APPENDIX 14.

Abridged statement of loans disbursed during 1953–54 *(fasli year) under the heads noted hereunder.*

District.	Intensive manuring Scheme.	Seeds and manures.	Implements.
	RS.	RS.	RS.
Kurnool	19,760	..	..
Kakinada	9,58,470	..	..
Eluru	9,55,210	..	..
Vijayavada	12,59,906	4,580	..
Anantapur	..	29,560	..
Guntur	9,92,030	47,850	..
Nellore	4,32,700	2,460	..
Cuddapah	27,640	60,340	..
Srikakulam	72,715	28,010	..
Anakapalle	1,06,180	30,080	..
Bellary	15,095	13,800	..
Chittoor	44,400	16,090	..
Guindy	7,36,205	1,56,470	200
Coimbatore	1,47,225	62,820	580
Tiruchirappalli	10,45,560	1,00,970	1,680
Tanjore	10,23,490	64,490	2,500
Pattukkottai	9,70,980	66,960	210
Tirunelveli	4,92,065	55,365	70
Ramanathapuram	51,100	98,800	1,625
Ootacamund	..	36,870	760
Madurai	7,84,522	1,14,240	270
Cuddalore	3,93,750	54,712	1,200
Vellore	88,485	1,07,080	280
Tellicherry	11,670	1,12,370	800
Shoranur	13,580	42,235	250
Mangalore	51,660	33,660	..
Salem	43,590	86,190	200
Total ..	1,07,37,988	14,26,002	1,870
			12,495

APPENDIX 15.

Statement showing the expenditure and receipts of the Agricultural Research Stations for the financial years 1952–53 *and* 1953–54.

Serial number and name of station.	1952–53 (*financial*).		1953–54 (*financial*).	
	Expenditure.	*Receipts.*	*Expenditure.*	*Receipts.*
(1)	(2)	(3)	(4)	(5)
	RS.	RS.	RS.	RS.
1 Rice Research Station, Tirurkuppam	25,129	5,510	23,951	8,886
2 Agricultural Research Station, Palur	31,017	19,652	26,495	31,439
3 Do Tindivanam ..	32,009	27,152	28,615	25,365
4 Do Aduthurai ..	41,477	40,492	38,542	57,616
5 Do. Pattukkottai ..	14,982	10,850	13,015	10,834
6 Rice Research Station, Ambasamudram	13,930	10,918	20,412	12,592
7 Agricultural Research Station, Kovilpatti ..	27,576	11,901	25,560	17,001
8 Millet Breeding Station, Ariyalur	1,616	548	1,560	469
9 Do Tirupattur	2,050	464	2,167	1,444
10 Do Coimbatore	18,701	12,205	17,268	15,694
11 Cotton Breeding Station, Coimbator	12,930	7,339	13,202	16,082
12 Paddy Breeding Station, Coimbatore	13,609	6,585	19,004	5,751
13 Central Farm, Coimbatore	79,524	31,172	81,909	87,874
14 Agricultural Research Station, Taliparamba ..	38,337	17,814	24,979	21,641
15 Do. Pattambi ..	53,742	34,355	38,079	31,189
16 Do. Nileshwar (3 stations).	27,870	17,626	17,497	17,242
17 Paddy Breeding Station, Mangalore	18,320	11,973	16,210	15,000
18 Sugarcane Research Station, Gudiyattam ..	20,887	16,418	19,816	14,450
19 Agricultural Research Station, Ambalavayal ..	45,652	23,653	30,033	20,472
20 Do. Nanjanad ..	30,064	30,083	29,421	40,434
21 Fruit Station, Kallar	15,034	14,351	11,539	14,226
22 Do. Burliar	5,239	4,416	4,382	4,306
23 Pomological Station, Coonoor	12,483	5,507	8,715	6,397
24 Agricultural Research Station, Satyamangalam ..	11,133	1,495	15,525	2,844
25 Arecanut Research Station, Vittal	7,006	4,145	11,376	10,808
26 Banana Research Station, Aduthurai	14,320	12,477	12,010	10,826
27 Botanical Gardens, Coimbatore	8,949	2,745	6,687	3,649
28 Do. Ooty	22,067	8,511	18,904	9,293
29 Sim's Park, Coonoor	8,026	5,774	8,172	5,971
Total	6,53,679	3,96,131	5,85,045	5,18,645

APPENDIX 16.

Statement showing the work done by the several officers in charges of crop-cutting experiments, etc., during the period 1st October 1953 *to 30th June* 1954.

Designation of the officer.	Number of days toured.	Number of villages visited.	Number of experiments visited at several stages.
Headquarters—			
Special Deputy Director of Agriculture (Crop Sampling), Senior District Agricultural Officer (Crop Sampling), Madras.	118	56	58
Mufassal centres—			
1 Special District Agricultural Officer (Crop Sampling), Tanjore.	167	83	160
2 Special District Agricultural Officer (Crop Sampling), Salem.	208	111	148
3 Special District Agricultural Officer (Crop Sampling), Madurai.	149	83	132
4 Special District Agricultural Officer (Crop Sampling), Shoranur.	170	142	113
Total ..	694	419	553
Average ..	173½	105	138

Statement showing the progress of paddy experiments region wise.

Region	Paddy First. P.	Paddy First. C.	Paddy First. Percentage.	Paddy Second. P.	Paddy Second. C.	Paddy Second. Percentage.	Paddy Third. P.	Paddy Third. C.	Paddy Third. Percentage.
Salem	38	26	68·4	262	218	83·2	40	32	80·0
Shoranur	156	150	96·2	204	194	95·1	..	..	..
Tanjore	56	55	98·2	336	313	93·2	8	6	75·0
Madurai	50	47	94·0	326	312	95·7	..	..	..
Total	300	278	92·7	1,128	1,037	91·9	48	38	79·2

P=Planned. C=Completed and considered for analysis.
Percentage of the number completed and taken for analysis to the total planned.

APPENDIX 17.

Grow More Food aids experiments regionwise.

Region.	Improved seed. P.	Improved seed. C.	Improved seed. Percentage.	Green manure (Sesbania). P.	Green manure (Sesbania). C.	Green manure (Sesbania). Percentage.	Amonium sulphate. P.	Amonium sulphate. C.	Amonium sulphate. Percentage.
Salem	28	18	64·3	4	1	25·0	21	15	71·4
Shoranur	..	..	..	4	3	75·0	17	17	100·0
Tanjore	40	32	80·0	42	33	78·6	34	31	91·2
Madurai	20	16	80·0	23	18	78·3	19	15	78·9
Total	88	66	75·0	73	55	73·3	91	78	85·7

P=Planned. C. Completed and considered for analysis.
Percentage of the number completed and taken for analysis to the total planned.

APPENDIX 18.

Statement showimg the progress of experiments regionwise allotted to Revenue Inspectors.

Region. (1)	Unirrigated ragi. P. (2)	Unirrigated ragi. C. (3)	Unirrigated ragi. Percentage. (4)	Unirrigated cholam. P. (5)	Unirrigated cholam. C. (6)	Unirrigated cholam. Percentage. (7)	Irrigated cholam. P. (8)	Irrigated cholam. C. (9)	Irrigated cholam. Percentage. (10)
Salem	220	112	50·9	230	122	53·04	70	44	62·9
Tanjore	90	48	53·3	178	89	50·0	52	45	86·5
Madurai	70	*24	34·3	124	62	50·0	222	74	33·3
Shoranur	80	30	37·5	160	58	36·3	50	42	84·0
Total ..	460	214	46·5	692	331	47·8	394	205	52·03

Region.	Irrigated cumbu. P. (11)	Irrigated cumbu. C. (12)	Irrigated cumbu. Percentage. (13)	Unirrigated cumbu. P. (14)	Unirrigated cumbu. C. (15)	Unirrigated cumbu. Percentage. (16)	Irrigated ragi. I P. (17)	Irrigated ragi. I C. (18)	Irrigated ragi. I Percentage. (19)	Irrigated ragi. II P. (20)	Irrigated ragi. II C. (21)	Irrigated ragi. II Percentage. (22)
Salem	60	24	40·0	†240	108	45·0	150	76	50·7	136	74	54·4
Tanjore	40	20	50·0	200	98	49·0	98	70	71·4	62	34	54·8
Madurai	50	22	44·0	220	71	32·3	186	107	57·5	‡8	..	..
Shoranur	50	28	56·0	140	78	55·7	74	36	48·6	6	6	100
Total ..	200	94	47·0	800	355	44·4	508	289	56·7	212	114	53·8

* All the ten experiments planned in Madurai district were lost.
† 20 experiments planned in Chingleput district were lost.
‡ 8 experiments planned in Ramanathapuram district were lost.
P=Planned. C.—Completed and considered for analysis.
P=Percentage of the number completed and taken for analysis to the total planned.

APPENDIX 19.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Crop—Paddy first period.

Statement showing the estimated average yield, sampling error and total production.

District.	Number of experiments. Planned.	Number of experiments. Considered for analysis.	Estimated average yield of rice in lb./acre.	Sampling error of the estimated average in lb./acre (rice).	Percentage sampling error.	Area under paddy first period in '000' acres.	Estimated production of rice in '000' tons.
1 Chingleput	16	6	1,506·79	308·95	20·50	57	38
2 North Arcot	14	12	1,648·62	178·01	10·80	81	60
3 Salem	8	8	1,058·10	174·83	16·52	34	16
4 Coimbatore	22	16	1,853·18	411·80	22·22	28	28
5 Malabar	66	66	734·49	62·52	8·51	468	153
6 South Kanara	68	68	904·21	58·96	6·52	348	140
7 South Arcot	4	4	932·77	229·27	24·58	59	25
8 Tanjore	40	40	1,227·15	86·60	7·06	98	54
9 Tiruchirappalli	12	11	1,167·01	140·20	12·01	26	14
10 Madurai	22	22	1,643·22	262·22	15·96	32	23
11 Tirunelveli	28	25	1,557·50	145·43	9·34	77	54
Total (for the districts covered by the survey).	300	278	992·81	45·46	4·59	1,308 1,319	600 605

NOTE.—Allowance for area occupied by bunds not made.

APPENDIX 20.

Crop-cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1368. Crop—Paddy second period.

Statement showing the estimated average yield, sampling error and the total production in terms of dried and cleaned produce.

Serial number and district.	Rice. Number of experiments. Planned.	Number of experiments. Considered for analysis.	Estimated average yield on lb./acre (in terms of dried and cleaned rice).	Standard error of the estimated average in lb./acre—Rice.	Percentage of standard error.	Area under the crop used for estimating the production (in '000' acres) as per final forecast report.	Production in '000' tons estimated.
1 Chingleput	90	74	754·13	59·63	7·91	480	162
2 North Arcot	108	80	1,162·41	94·85	8·16	341	177
3 Salem	64	64	1,591·46	94·51	5·94	158	112
4 South Arcot	116	113	1,198·38	60·51	5·05	449	240
5 Tanjore	140	122	1,083·64	41·96	3·87	1,225	592
6 Tiruchirappalli	80	78	1,075·94	69·47	6·46	388	186
7 Madurai	98	91	1,089·59	56·87	5·22	248	121
8 Ramanathapuram	126	121	716·86	59·42	8·29	308	99
9 Tirunelveli	102	100	1,232·59	90·95	7·38	221	121
10 Coimbatore	68	59	1,512·99	96·65	6·39	106	72
11 Malabar	74	74	755·13	57·16	7·57	359	121
12 South Kanara	52	52	761·83	62·40	8·19	226	77
13 The Nilgiris	10	9	537·38	43·05	8·01	8	2
Total ..	1,128	1,037	1,008·18	21·81	2·16	4,517	2,082

APPENDIX 21.

Crop-cutting surveys by the random sampling method.

State—Madras. Year—1953–54. Fasli—1363. Crop—Paddy third period.

Statement showing the estimated average yield, sampling error and the total production in terms of dried and cleaned produce.

Rice.

Serial number and district.	Number of experiments: Planned.	Number of experiments: Considered for analysis.	Estimated average yield on lb./acre (in terms of dried and cleaned produce rice).	Standard error of the estimated average in lb./acre—Rice	Percentage of standard error.	Area under the crop used for estimating the production (in '000' acres) as per final forecast report.	Production in '000' tons estimated.
1 Chingleput	24	18	1,176·28	168·21	14·30	108	54
2 North Arcot	8	6	1,218·56	179·85	14·76	98	53
3 Salem	8	8	1,552·01	148·78	9·59	19	13
4 Tiruchirappalli	8	6	428·51	132·62	30·95	26	5
Total for the districts covered by the survey.	48	38	1,206·54	98·24	8·14	246	125
For districts not covered by the survey.	..	..	..	..	..	297	160
Total ..	48	38	1,206·54	98·24	8·14	543	285

N.B.—No allowance has been made for the area occupied by bunds.

APPENDIX 21-A.

Statement showing the combined results of crop cutting experiments on Paddy I, II and III period during 1953–54 as compared with official estimates.

District. (1)	Area under paddy as per final fore cast report in '000' acres. (2)	Estimated yield of paddy per acre in lb.: As per crop cutting experiments. (3)	Estimated yield of paddy per acre in lb.: As per official estimates. (4)	Production of paddy in '000' tons.: As per crop cutting experiments. (5)	Production of paddy in '000' tons.: As per official estimates. (6)
	ACS.	LB.		TONS.	
Chingleput	640	1,327·01	1,306	379	373
North Arcot	520	1,863·73	1,650	433	383
Salem	210	2,241·39	1,835	210	172
South Arcot	575	1,749·37	1,656	449	425
Tanjore	1,340	1,635·36	1,565	978	936
Tiruchirappalli	440	1,556·81	1,787	306	351
Madurai	360	1,738·49	1,836	279	295
Ramanathapuram	380	1,199·18	1,533	203	260
Tirunelveli	350	1,940·60	1,978	303	309
Coimbatore	140	2,340·13	1,744	146	109
Malabar	835	1,116·25	1,250	416	466
South Kanara	580	1,271·43	1,371	330	355
The Nilgiris	8	602·06	1,680	3	6
Total ..	6,378	11,557·81	1,559	4,435	4,440

APPENDIX 22.

Statement showing the results of analysis of Grow More Food experiments on paddy conducted during 1953–54 in Madras State.

Category of aid.	Number of experiments: Planned.	Number of experiments: Considered for analysis.	Average estimated yield of rice from: Grow More Food plots lb./acre.	Average estimated yield of rice from: Control plot lb./acre.	Additional yield of rice lb./acre.	Sampling error of the additional yield of lb./acre.	Percentage Sampling error of the additional yield.
1 Improved seed	88	66	1,581·16	1,387·82	193·34	38·40	19·86
2 Green manure (Sesbania) ..	73	55	1,529·90	1,350·05	179·85	39·40	21·91
3 Ammonium sulphate	91	78	1,476·60	1,225·85	250·75	30·49	12·16

APPENDIX 23.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953–54. Fasli—1363. Crop—Irrigated cumbu.

Statement showing the estimated average yield, sampling error and the total estimated production.

Serial number and district.	Number of experiments: Planned.	Number of experiments: Conducted.	Area estimated under irrigated cumbu during 1953–54 (figures in '00' acres as per final forecast figures.	Estimated average yield in lb./acre (in terms of dried and cleaned produce.	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Production in '00' tons estimated.
1 North Arcot	20	8	140	783·14	217·38	27·75	49
2 Salem	40	16	314	680·81	282·25	41·46	95
3 Tiruchirappalli	40	20	228	374·06	38·50	10·29	38
4 Madurai	10	4	97	1,248·44	657·81	52·69	54
5 Ramanathapuram	40	18	83	668·19	273·13	45·61	25
6 Coimbatore	50	28	386	689·38	110·81	16·07	119
Total (for the districts covered by the survey).	200	94	1,248	620·81	82·19	13·24	380
Total for the State ..	..	..	1,388	620·81	..	..	419

N.B.—No allowance has been made for area occupied by bunds.

APPENDIX 24.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1363. Crop—Unirrigated cumbu.

Statement showing the estimated average yield, sampling error and the total estimated production.

District.	Number of experiments. Planned.	Number of experiments. Conducted.	Area during 1953-54 in '00' acres (as per final forecast figures).	Estimated average yield in lb. acre (in terms of dried and cleaned produce).	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Production in '00' tons estimated.
1 Salem	140	68	2,236	451·69	40·50	8·97	451
2 North Arcot	80	40	540	319·13	42·80	12·81	77
3 South Arcot	90	48	1,165	516·81	53·00	10·26	269
4 Tiruchirappalli	110	50	2,272	236·75	52·00	21·96	240
5 Madurai	50	14	503	246·00	65·25	26·52	55
6 Ramanathapuram	100	32	1,417	370·69	98·81	26·66	224
7 Tirunelveli	70	25	1,819	281·56	53·00	18·82	229
8 Coimbatore	140	78	2,514	369·69	60·06	16·24	415
State (for the districts covered by the survey).	800*	355	12,466	360·56	19·68	5·46	1,970
Total for the State ..	..	..	12,632	360·56	..	..	1,997

*(1) Includes 20 experiments planned in Chingleput district. No experiment was completed in that district.
(2) No allowance has been made for area occupied by bunds.

APPENDIX 25.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1363. Crop—Irrigated ragi first period.

Statement showing the estimated average yield, sampling error and the total estimated production.

District.	Number of experiments Planned.	Number of experiments Conducted.	Area during 1953-54 in '00' acres (as per final forecast figures).	Estimated average yield in lb./acre (in terms of dried and cleaned produce).	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Production in '00' tons estimated.
1 Chingleput	58	31	377	845·50	91·69	10·85	142
2 North Arcot	70	37	427	889·75	117·88	13·19	170
3 Salem	22	8	304	648·44	104·00	16·04	88
4 South Arcot	70	48	419	1,136·44	122·13	10·75	213
5 Tiruchirappalli	28	22	115	1,006·19	123·00	12·22	52
6 Madurai	9	54	446	1,263·81	99·81	7·90	252
7 Ramanathapuram	72	43	177	756·68	49·68	6·56	60
8 Tirunelveli	24	10	268	952·25	189·94	19·95	114
9 Coimbatore	74	36	435	1,134·31	146·00	12·87	220
State (for the districts covered by the survey).	508	289	2,968	999·88	37·06	3·71	1,311
State as a whole ..	..	..	3,047	999·88	..	..	1,346

N.B.—No allowance has been made for the area occupied by bunds.

APPENDIX 26.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1363. Crop—Irrigated ragi second period.

Statement showing the estimated average yield, sampling error and the total estimated production.

District.	Number of experiments. Planned.	Number of experiments. Conducted.	Area during 1953-54 in '00' acres (as per final forecast figures).	Estimated average yield in lb./acre (in terms of dried and cleaned produce).	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Production in '00' tons estimated.
1 Chingleput	34	10	118	697·81	152·44	21·85	8
2 North Arcot	72	46	449	1,190·06	111·19	9·34	239
3 Salem	30	18	95	1,475·63	191·56	12·98	63
4 Coimbatore	6	6	65	821·88	287·50	34·98	24
5 South Arcot	40	24	226	1,498·75	258·63	17·26	151
6 Tiruchirappalli	22	10	123	881·88	258·44	29·31	48
7 State (for the districts covered by the survey).	238*	114	1,076	1,235·38	76·56	6·20	562
State as a whole ..	..	..	1,327	1,235·38	..	..	700

* This includes 26 experiments which were shifted from the first period to second period. Out of the 26 experiments allotted to Tirunelveli district only 2 were completed which were not considered for analysis. In Ramanathapuram district out of the 8 experiments allotted no experiment was completed.

N.B.—No allowance has been made for area occupied by bunds. (*a*) Figures in '00' acres a per final forecast report.

APPENDIX 27.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1363. Crop—Unirrigated ragi.

Statement showing the estimated average yield, sampling error and the total production in terms of dried and cleaned *grain*.

District.	Number of experiments. Planned.	Number of experiments. Considered for analysis.	Estimated average yield in lb./acre (dried and cleaned grain).	Sampling error of the estimated average in lb./acre.	Percentage sampling error.	Area under the crop used for estimating the production (in '00' acres) as per final forecast report.	Estimated production in "00" tons (dried and cleaned grain).
1 Chingleput	60	12	792·31	362·38	45·74	256	91
2 Salem	140	92*	625·38	64·00	10·23	2,451	684
3 North Arcot	20	8	298·44	44·94	15·06	124	17
4 South Arcot	20	14	372·19	145·69	39·14	95	16
5 Tiruchirappalli	70	34	578·13	69·38	12·00	321	88
6 Madurai	10	Lost†	..	..	..	..	..
7 Ramanathapuram	60	24	406·06	68·75	16·93	466	84
8 Coimbatore	80	30	650·13	86·75	13·34	850	247
State (total for the districts covered by the survey).	460	214	607·88	37·81	6·22	4,563	1,223
State as a whole ..	..	..	607·88	..	..	4,806	1,288

NOTE.—No correction has been made for the areas occupied by bunds.

* Ninety-four experiments were completed in Salem district but two experiments were not taken into consideration or analysis.

† All the experiments planned in Madurai district were lost.

APPENDIX 28.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1363. Crop—Irrigated cholam.

Statement showing the estimated average yield, sampling error and the total production in terms of dried and cleaned *grain*.

District.	Number of experiments for		Estimated average lb./acre in yield (dried and cleaned grain).	Sampling error of the estimated average in lb./acre	Percentage sampling error.	Area under the crop used for estimating the production (in '00' acres) as per final forecast report.	Estimated production in '00' tons (dried and cleaned grain).
	Planned.	Considered analysis.					
1 Salem	40	20	1,494·94	133·63	8·93	320	214
2 North Arcot	30	24	982·31	179·19	18·24	141	62
3 Tiruchirappalli	52	45	912·56	117·44	12·87	575	234
4 Madurai	72	34	1,162·13	140·06	12·05	1,070	555
5 Ramanathapuram	80	12	998·44	206·13	20·64	221	99
6 Tirunelveli	70	28	880·81	111·88	12·70	569	224
7 Coimbatore	50	42	1,177·88	180·06	15·29	920	484
State (for the districts covered by the survey.)	394	205	1,100·13	58·19	5·29	3,816	1,872
State as a whole ..	..	..	1,100·13	..	..	3,878	190·2

APPENDIX 29.

Crop cutting surveys by the random sampling method.

State—Madras. Year—1953-54. Fasli—1363. Crop—Unirrigated cholam.

Statement showing the estimated average yield, sampling error and the total production in terms of cleaned and dried grain.

District.	Number of experiments for		Estimated average lb./acre in yield (dried and cleaned grain).	Sampling error of the estimated average in lb./acre.	Percentage of sampling error.	Area under the crop used for estimating the production (in '00' acres) as per final forecast report.	Estimated production in '00' tons (dried and cleaned grain).
	Planned.	Considered analysis.					
1 Salem	140	74	571·06	84·18	14·78	2·180	556
2 North Arcot	90	48	419·94	63·25	15·06	959	180
3 South Arcot	50	30	399·88	59·50	14·88	1,270	227
4 Tiruchirappalli	128	59	339·18	46·56	13·73	2,375	360
5 Madurai	108	50	571·56	95·94	16·79	1,880	467
7 Tirunelveli	16	12	294·25	140·25	47·66	231	0
7 Coimbatore	160	58	191·88	38·00	19·80	4,080	349
State (for the districts covered by the survey).	692	331	397·13	25·44	6·41	12,925	2,169
State as a whole ..	..	..	397·13	..	..	1392·5	2,236

NOTE.—No correction has been made for the area occupied by bunds.

APPENDIX 30.

Statement showing the distribution of tractors and bulldozers.

Name of the district.	Number with bull dozers.	Number without bull dozers.	Total.
1 Chingleput	8	7	15
2 North Arcot	4	4	8
3 South Arcot	4	8	12
4 Tanjore	11	9	20
5 Tiruchirappalli	4	8	12
6 Madurai	8	5	13
7 Ramanathapuram	4	6	10
8 Tirunelveli	3	6	9
9 Salem	6	4	10
10 Coimbatore	13	9	22
11 The Nilgiris	3	1	4
12 North Malabar	3	3	6
13 South Malabar	5	1	6
14 South Kanara	8	1	9
15 Tindivanam	..	2	2
16 Wynaad	1	..	1
Total ..	85	74	159

APPENDIX 31.

Particulars of types of tractors and their horse-power held by the department.

Name and type of tractor.	Horse power.	Total number with bulldozer.	Total number without bulldozer.
Small type—			
1 10/20 Mc. Cornic Deering Tractor	20	..	2
2 Mc. Cornic Deering W. 4	25	..	2
3 Massey Harris 30K	22	..	8
4 Massey Harris 20K	18·5	..	11
Medium type—	40	..	5
1 I.H.C. W.D. 9	40	7	2
2 I.H.C. T.D. 9	30	..	16
3 I.H.C. W. 6	30	16	1
4 I.H.C. T. 6	30	..	3
5 Fordson Major	40	..	12
6 John Deer AW & A.R.	40	..	1
7 L.H. Case	34	2	4
8 I.H.C. T.D. 6	45	15	..
9 Caterpillar D4	28	..	7
10 David Brown			
Heavy type—	65	25	..
11 Caterpillar D6	75	11	..
12 Caterpillar D7	65	9	..
13 I.H.C. T.D. 14	..	85	74
Total ..			

APPENDIX 32.

Statement showing the types and models of tractors with the Agricultural Department.

Year.	I.H.C. consisting T6, TD6, TD9, W4, 10/20 W.D. 9, TD14, W6.	John Deer consisting AR & WR Models.	Caterpillar D4, D6, and D7.	L.H. case.	Massey Harris consisting of 30K & 20K.	Fordson Major.	David Bro
1953-54	66	12	51	1	19	3	7

Total Nos. 159.

APPENDIX 33.

Statement showing the outturn of the tractors and bulldozers.

	Name of the district.	Total number of hours the bulldozer worked.	Total outturn ploughing, levelling and harrowing in acres.
1	Chingleput	3,722	1,190
2	North Arcot	4,610	911
3	South Arcot	4,556	2,877
4	Tanjore	1,615	2,686
5	Tiruchirappalli	4,066	1,153
6	Madurai	4,502	733
7	Ramanathapuram	759	1,097
8	Tirunelveli	2,499	504
9	Salem	918	1,154
10	Coimbatore	9,701	2,247
11	Nilgiris	1,827	175
12	North Malabar	1,636	892
13	South Malabar	4,728	321
14	South Kanara	6,492	408
15	Tindivanam	..	69
16	Wynaad	776	218
	Total ..	52,407	16,635

APPENDIX 34.

Statement showing the progressive increase on the hire charges on tractors and bulldozers.

	Particulars of work.	Rates of hire charges including transport charges borne by ryots. From 1st April 1946 to 30th June 1950.	From 1st July 1950 to 31st March 1952.	From 1st April 1952.
1	Ploughing by all type of tractors.	Rs. 5 per acre ..	Rs. 10 per acre ..	Rs. 12 per acre.
2	Ploughing shallow ploughing ..	Rs. 3 do. ..	Rs. 5 do. ..	Rs. 7 do.
3	Levelling with bulldozers—			
	D. 7	Rs. 9 per hour ..	Rs. 12 per hour.	Rs. 14 per hour.
	D. 6	Rs. 7 do. ..	Rs. 10 do.	Rs. 12 do.
	T.D. 14	Rs. 7 do. ..	Rs. 10 do.	Rs. 12 do.
	T.D. 9	Rs. 7 do. ..	Rs. 8 do.	Rs. 10 do.
	T.D. 6	Rs. 7 do. ..	Rs. 8 do.	Rs. 10 do.
	T. 6	Rs. 7 do. ..	Rs. 8 do.	Rs. 10 do.
	D. 4	Rs. 5 do. ..	Rs. 8 do.	Rs. 10 do.

APPENDIX 35.

Statement showing the acreage tackled by departmental tractors from 1st October 1953 to 30th June 1954.

1	Target in acres	19,725
2	Outturn in acres	16,635
3	Number of hours worked by bulldozers	52,407
4	Additional foodgrains in tons	1,481
5	Number of tractors with bulldozers and without bulldozers ..	159
6	Number of bulldozers	85

APPENDIX 36.

Statement showing the tractors and implements available with the department.

	Particulars.	Year 1953-54.
1	Tractors	74
2	Bulldozers	85
3	Mould board ploughs	89
4	Disc harrows, harrow ploughs, cultivators and tillers	100
5	Disc ploughs	31
6	Rotavators	7

APPENDIX 37.

Machinery purchases during the year under report (53-54)—*Nil.*

Machines purchased and supplied under hire purchase system.

Description.	Number received.	Name of the firm.	G.O. number and date.
John Deere Model M ..	1	Messrs. Larsen and Toubro.	G.O. Ms. No. 50, Agriculture (Food Production), dated 19th February 1954.
Do. R ..	1	Do.	....
Do. MC ..	2	Do.	....
Farmall M	3	Messrs. Volkart Brothers	....
Ferguson	2	Messrs. T.V.S. & Sons ..	....
Do.	1	Messrs. Sundaram Motors.	....
	10		
Ferguson	1	Messrs. Sundaram Motors.	G.O. Ms. No 126, Agriculture, (Food Production), dated 17th April 1951.
Do.	3	Messrs. T.V.S. & Sons ..	....
Do.	2	Kamini Engineering Corporation.	....
Farmall M	2	Messrs. Volkart Bros. ..	....
Farmall Super A	1	Do. ..	....
Farmall B.M.	2	Do. ..	....
John Deer MC	2	Messrs. Larsen and Toubro.	....
Total ..	13		

APPENDIX 38.

Statement showing the jurisdiction of the Assistant Agricultural Engineers.

	Name of each Assistant Agricultural Engineer with headquarters.	Name of the district or districts in his jurisdiction.
1	Assistant Agricultural Engineer (Inspection), Tiruchirappalli.	South Arcot, Tanjore and Tiurchirappalli.
2	Assistant Agricultural Engineer (Inspection), Madurai.	Madurai, Ramanathapuram and Tirunelveli.
3	Assistant Agricultural Engineer (Tractor Workshops), Coimbatore.	Coimbatore and Nilgiris.
4	Assistant Agricultural Engineer, Saidapet (Chingleput).	Chingleput.
5	Assistant Agricultural Engineer Research, Coimbatore.	North Malabar, South Malabar and South Kanara.

The Gazetted Assistant to Assistant Agricultural Engineer (Research) was in charge of inspection work in North Malabar, South Malabar and South Kanara districts. On the abolition of the post of Gazetted Assistant to Assistant Agricultural Engineer (Research) from 31st October 1953 the work was taken over by Assistant Agricultural Engineer (Research), Coimbatore.

APPENDIX 39.

Statement showing the rates of hire charges collected in other States including Madras State.

Name of the State.	Ploughing shallow ploughing or levelling.	Deep ploughing.	Levelling or bunding.	Ploughing cultivated lands.	Levelling.	Discing.	Ploughing hariyar land.	Shallow ploughing.	Shrub jungle clearing.	Harrowing single	Harrowing double.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Travancore—Cochin	20 p.a.	..	..	..	..	..	..	..	..	..	..
Madya Bharath—Gwallar	..	30 p.a.	30 p.h.	..	..	..	..	..	..	..	..
Kwanpur—Uttar Pradesh	..	..	..	25 p.a.	27 p.a.	..	35 p.a.	..	..	..	..
Sowrashtra—Rajkot	..	..	..	..	8 p.h.	12½ p.a.	..	..	..	..	..
Bihar Patna	..	..	..	..	..	..	..	..	..	..	..
West Bengal—Calcutta	..	..	..	20 p.a.	..	..	..	..	..	..	..
Madhya Pradesh—Nagpur	..	..	..	24 p.a.	20 p.h.	..	..	..	150 p.a.	..	..
Punjab—Simla	..	..	..	18 p.a.	25 p.a.	12 p.a.	29 p.a. to 35 p.a.	..	..	..	..
Hyderabad—Deccan	22 p.a.	..	14 p.h.	..	..	..	..	..	30 p.a.	..	..
Mysore—Bangalore	..	..	..	..	..	4 p.a.	..	..	20 p.a.	..	..
Assam—Shillong	..	..	..	..	..	..	..	..	..	9 p.a.	18 p.a.
Orissa—Cuttack	..	..	9 p.h.	..	..	..	..	..	..	..	..
East Punjab States Union—Nabha	..	..	..	17½ p.a.	..	12½ p.a.	30 p.a.	..	..	..	..
Vindhya Pradesh—Rava	35 p.a.	..	..	25 p.a.	..	..	..	..	..	..	..
Madras State	12 p.a.	12 p.a.*	..	..	..	..	..	..	..	7 p.a.	..

N.B.—p.a. = Per acre.
p.h. = Per hour.

* Bulldozer D. 4, TD9, TD6, T6—Rs. 10 per hour.
D.6., TD 14—Rs. 12 per hour.
D. 7—Rs. 14 per hour.

(1) Haulage purposes tractor with trailor—Re. 1-4-0 per mile.
(2) Mould board plough minimum Rs. 12 per day—Rs. 3 per acre.
(3) Disc Harrow minimum Rs. 6 per day—Re. 1-8-0 per acre.
(4) Tractor trailer pumpset—Rs. 8 per day.

Statement showing the rates of hire charges collected in other States including Madras State—contd.

Name of the State.	Sugarcane ploughing.	Ploughing.	Ploughing of waste land.	Second ploughing.	Cultivating.	Harrowing.	Sohaje.	Ploughing in black cotton soil.	Ploughing in red soil.	All types of operator.
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Travancore—Cochin	..	..	..	..	..	..	..	..	..	....
Madya Bharath—Gwallar	..	..	..	..	..	..	..	..	..	....
Kwanpur—Uttar Pradesh	..	..	..	..	..	..	..	..	..	....
Sowrashtra—Rajkot	..	22½ p.a.	..	..	..	..	..	..	..	....
Bihar—Patna	..	..	..	..	..	..	..	..	..	Rs. 3-8-0 p.h. or Rs. 28 per day.
West Bengal—Calcutta	..	..	30 p.a.	15 p.a.	10 p.a.	10 p.a.	..	..	..	....
Madhya Pradesh—Nagpur	..	..	..	..	..	..	..	..	..	....
Punjab—Simla	..	..	..	..	..	..	7 p.a.	..	..	....
Hyderabad—Deccan	..	24 p.a.	..	..	..	..	..	..	..	....
Mysore—Bangalore	25 p.a.	30 p.a.	7½ p.a.	..	..	4 p.a.	..	15 p.a.	10 p.a.	....
Assam—Shillong	..	24 p.a.	..	..	..	..	..	..	..	....
Orissa—Cuttack	..	..	..	..	..	..	..	..	..	Rs. 4-1-0 to 7-15-0 p.a.
East Punjab States Union—Nabha	..	..	..	..	7½ p.a.	..	..	..	..	....
Vindhya Pradesh—Rava	..	..	..	..	..	10 p.a.	..	..	..	....
Madras State	..	..	..	..	..	..	..	..	..	....

N.B.—p.a. = Per acre.
p.h. = Per hour.

APPENDIX 40.

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 half per cent. The straw that comes out of the machine after threshing is soft and palatable. It does not need any further treading by 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 adhering soil. The pods are delivered thoroughly cleaned into sacks without loss of the 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. *Hay press.*—Straw has to be pressed and baled for transport in rail wagons or stacking. The mechanically operated straw baling press presses the straw and ties them in bales and releases for being transported easily.

4. *Roger Compost Shredder mixer.*—One small demonstration unit of the compost shredder mixer purchased from Messrs. Roger Foundry and Machine Company, Cincinatti, United States of America, can be operated by an electric motor tractor or belt power.

Shovel loads of compost material are fed to hopper and the combing belt goes to work on it. The steel teeth or springs are mounted on an endless belt of tough resilient composition. The belt travels at an angle of 45 degrees. Teeth are so shaped and rows so spaced that the material does not become impaled but cascades on rapidly moving teeth until it is small enough to drop between them. Finished compost is then discharged by centrifugal force. The deflector adjusts for piling in windrows, trucks or tote boxes. Sweeps at discharge opening keeps over size particles in the hopper for further shredding to proper size before discharge. Waste materials and trash discharge at bottom by lifting retaining gate. Experiments conducted at Coimbatore showed that the optimum conditions for working the machine are moist compost at a speed of 1,000 R.P.M. The turn-over at this speed was 2½ 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 to 8 feet and uniform spreading is obtained.

5. *Kennels Automatic Oscillator sprayer.*—The equipment consists of 15 lengths of 1¼ inches diameter pipes of light weight and 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 1/64 inches 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 chamber in which the piston is fitted. Two openings are provided one at each side. Water with force enters the chambers alternatively through the two openings and this causes the entire pipe line to oscillate through 90 degrees on 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 overhead irrigation on a large scale for agricultural purposes. For sandy areas which do not permit the usual flow irrigation methods, this method of rainer 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.

6. *Bullock drawn mower.*—One bullock mower was purchased from Messrs. Volkart Bros., Ltd., Madras, with the 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.

7. *O.B. 5 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 of an electric motor on a swivel base, 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 is fast 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 particulars and is of special advantage to dairies as also for individual owners keenly interested in the welfare of their livestock.

APPENDIX 41.

List of agricultural schemes in progress in Madras State during 1953–54.

(*a*) Schemes 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)	(2)	(3)	(4)
1 Banana Scheme ..	Aduthurai (Tanjore district).	Banana Research Officer.	For research work on bananas of the State classification breeding and improvement work.
2 Scheme for scientific aid to 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.
3 Scheme for scientific aid to cardamom industry in South India.	Singampatti (Tirunelveli).	Cardamom Specialist.	To produce better types of cardamom by weeding and to devise control measures for cardamom pests.
4 Scheme for research in ginger cultivation.	Malabar	Paddy Specialist ..	For research in varietal, manurial, cultural, preservation and cure of diseases of ginger.
5 Scheme for the multiplication and distribution of hybrid cumbu strains.	Coimbatore district and Koilpatti.	Millet Specialist ..	To evolve and multiply on a large scale cumbu hybrid strains which have hybrid vigour.
6 Scheme for investigation of blast and foot-rot disease of rice.	Coimbatore	Assistant Mycologist.	To control blast and foot-rot by resistant varieties and use of fungicides.
7 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 occurence of pest and diseases, etc.
8 Scheme for varietal and agronomic trials to determine optimum yield.	Tanjore	Assistant Agricultural Chemist, Tanjore.	To conduct simple manurial experiments and soil survey.
9 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.
10 Scheme for research on Cashewnuts.	South Kanara ..	Assistant Fruit Specialist, Mangalore.	To undertake research in cashewnut in the State varieties cultivation method, etc.
11 Scheme for Regional Bee Research Station in Madras State.	Coimbatore	Government Entomologist.	To investigate the possibilities of improving the Indian Honey Bee.
12 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.
13 Scheme for improvement of sweet potato and tapioca.	Mangalore, Coimbatore 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.
14 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.

(*b*) Schemes financed by Indian Central Cotton Committee.

1 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.
2 Scheme for improvement of Tinnies and Karunganni cotton.	Koilpatti	Assistant Cotton Specialist, Koilpatti.	To evolve a cosmopolitan Karunganni type with high ginning percentage and staple length.
3 Scheme for the breeding of long staple American cotton as winter crop for Central district and Sea Island cotton for West Coast.	Tiruchengode, Avanashi, Srivilliputtur, Nileshwar, Pattambi and Coimbatore.	Assistant Cotton Specialist, Cambodia 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.
4 Scheme for the breeding of unirrigated Cambodia cotton in Periyakulam.	Periyakulam, Madurai district.	Assistant Cotton Specialist, Koilpatti.	To breed a suitable irrigated Cambodia cotton suitable for Coimbatore, Salem, Tiruchirappalli and Madurai districts.
5 Scheme for maintenance of nucleus of pure seeds of improved cotton strains.	Coimbatore	Cotton Specialist, Coimbatore.	To produce seed seeds of all improved strains Co. 2 and MU. 1.

List of agricultural schemes in progress in Madras State during 1953–54—cont.

Number and name of the scheme. (1)	Place of working. (2)	Officer-in-charge. (3)	Object of the scheme. (4)
(*b*) Schemes financed by Indian Central Cotton Committee—*cont.*			
6 Scheme for the multiplication of MU. 1 cotton.	Coimbatore district ..	Assistant Cotton Specialist, Tiruppur.	To multiply and distribute pure seeds of MU. 1 cotton on large scale.
7 Combined scheme for multiplication and distribution of K. 2, M.U. 1 and M.U 2 cotton.	Madural, Tirunelveli and Ramanathapuram districts.	Assistant Cotton Specialist, K2 and Co.4 Cotton Scheme, Koilpatti.	To multiply and distribute on large scale pure seeds of K2 and Mu. 1 and Mu 2 cotton strains in Madurai, Tirunelveli and Ramanathapuram districts.
(*c*) Schemes financed by the Indian Central Sugarcane Committee.			
1 Scheme for sugarcane research in Madras State.	Gudiyattam	Sugarcane Agronomist.	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.	Nellikuppam and Kulitalai and 13 taluks in 15 districts.	Sugarcane Agronomist.	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.			
Scheme to run six zonal nucleus seed farms of improved oil-seeds.	Madras State ..	Oil-seeds Specialist ..	For large scale multiplication of pure seeds of improved strains of oil-seeds.
(*e*) Scheme financed by the Indian Central Coconut Committee.			
Scheme for establishment of coconut nurseries in the State.	Coimbatore, Tindivanam, Aduthural, Pattukottai, Pattambi, Nileshwar and Marudur.	Oil-seeds Specialist ..	To produce and supply good quality seedling to the public on a large scale.
(*f*) Schemes financed by the Madras Government alone.			
1 Scheme for the investigation of land development and reclamation of waste lands in the State.	Whole of State ..	Headquarters Deputy Director of Agriculture.	To survey and draw up a plan of reclamation of fallow and weed infested lands in Bellary district by tractors.
2 Scheme for the opening of regional Millets Research Sub-stations.	Ariyalur, Tiruppattur.	Millet Specialist, Coimbatore.	To evolve new strains of improved millets regions of the State.
3 Scheme for eradication of white borer of coffee.	Nilgiris	Government Entomologist.	To eradicate the white borer of coffee.
4 Scheme for the multiplication of K. 5 cotton.	Coimbatore	Assistant Cotton Specialist, Tiruppur.	To multiply and distribute pure seeds of K. 5.
5 Co. 4 Certification Scheme.	Coimbatore, Tiruchirapalli, Madurai, Salem, Ramanathapuram and Tirunelveli districts.	Certification Officer, Rajapalaym.	To issue certificate on purity of Co. 4 cotton to enable it to get exemption from price control.
6 Development of Fruit Industry in Kodaikanal.	Kodaikanal (Madurai district).	Horticulturist and Professor of Horticulture.	To improve the Friut Industry in Kodaikanal.
7 Scheme for training additional fieldmen and maistries.	Whole State	Director of Agriculture.	To provide additional trained field men and maistries for extension work.
8 Opening of an Agricultural Research Station, Satyamangalam.	Coimbatore district ..	Government Agricultural Chemist.	To study problems arising out of lower Bhavani Project in Coimbatore district.
9 Scheme for study of laterite soils.	Agricultural Research Station, Pattambi.	Do.	To find out the suitability of laterite soils for paddy cultivation.
10 Scheme for training of Agricultural and Botany graduates in Horticulture.	Coimbatore	Horticulturist and Professor of Horticulture, Coimbarore.	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 Schemes.

List of agricultural schemes in progress in Madras State during 1953–54—cont.

Number and name of the scheme. (1)	Place of working. (2)	Officer-in-charge. (3)	Object of the scheme. (4)
(*f*) Schemes financed by the Madras Government alone—*cont.*			
11 Scheme for the establishment of model orchard-*cum* nurseries in the State.	Selected districts in the State.	Horticulturist and Professor of Horticulture, Coimbatore.	To establish model orchards and nurseries which will serve as visual demonstrative centres of scientific orchard practices and nursery maintenance in an economic way.
12 Scheme for the large scale production of ergot on rye on the Nilgiris (permanent).	....	Government Mycologist.	Production of high quality ergot.
(*f*-1) 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 districts.	....	....	In operation.
2 Scheme for organization of and 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 areas, (2) manuring with ammonium sulphate and (3) mixed cropping with oil-seeds, chillies, and ragi and use of improved seeds.
2 Scheme for the cultivation of cotton in rice fallows of Tanjore, Tituchirapalli and South Arcot districts.	Tanjore, Pattukottai, Tiruchirapalli and North Arcot.	Do.	To extend cultivation of short duration cotton in the rice fallows of Tanjore, Tiruchirapalli and South Arcot districts.
3 Intensive cultivation schemes given below :—			
1 Plant Protection Scheme.			
2 Production and distribution of improved seeds of paddy.			
3 Production and distribution of improved seed of millets.			
4 Production and distribution of improved green manure seeds.	Whole State ..	Director of Agriculture.	To produce increased foodgrains as per target fixed.
5 Oil engine pumpsets.			
6 Electric motor pumpsets.			
7 Tractor cultivation.			
8 Central Agricultural Engineering Stores.			
9 Distribution of ammonium sulphate.			
10 Soil Conservation Scheme, Nilgiris.			
11 Intensive Manuring Scheme.			

APPENDIX 42.

Programme of work for 1954–55.

Research.

Research activities will be directed towards problems of integrated production schemes included in the Five-Year National Plan and the following programme for 1954–55 is drawn up.

Agricultural Education.

To meet the shortage for Agricultural graduates and to satisfy the large numbers seeking admission into the B.Sc. (Ag.) Degree Course, the number of seats for admission will be increased from 96 to 108.

Agricultural Chemistry.

Soils—(1) *Rapid soil tests.*—To determine the quantities of the major plant nutrients in the soil by means of rapid chemical tests.

(2) *Plant tissue tests.*—To assess the nutrient level of the soils.

(3) *Chromatography.*—Rapid estimation of inorganic and organic substances by means of paper chromatography.

(4) *Trace elements.*—Standardization of methods for the estimation of trace elements such as chromium, boron, manganese, cobalt, zinc and molybenum and the use of these for the estimation of these elements in soils.

Manures and plant nutrition.—(5) *Studies on compost making.*—To evolve the most efficient and most rapid method for compost making.

(6) *Legume studies.*—To select the most suitable nodule bacteria for specific legume inoculation and study their behaviour on host plant.

(7) *Water requirement of green manure crops.*—To aid in selecting suitable green manure for the different tracts of the State in relation to moisture condition obtaining in the tracts.

(8) *Permanent manurial experiments—Old and new.*—To obtain information on the organic and inorganic forms of manures and the function of each of the major nutrients on soil fertility, crop yield and plant composition.

(9) *Studies on indirect manuring of phosphate for paddy.*—To supply phosphates as per TVA plan to leguminous green manure crop which will be ploughed in later before paddy.

(10) *Chilean nitrate experiments.*—To compare chilean nitrate with ammonium sulphate as a source of N for different crops.

(11) *Studies on the use of sesbania speciosa in the dry form.*—To study the best method of preserving the green manure produced during the off-season for the use in the next paddy season.

(12) Studies on green leaf manuring with deep and shallow rooted plants to determine which is the better of the two.

(13) *Studies on silico-phosphate.*—To study methods of making insoluble phosphoric acid in rock phosphate available to crops.

(14) *Indian Council of Agricultural Research and Technical Co-operation Mission Schemes— Stewart's Scheme, Tanjore, Indian Council of Agricultural Research.*—(*a*) Simple manurial experiments in ryots' fields to assess the N and P205 requirement of Tanjore Soils.

(*b*) *Soil Survey of Tanjore district.*—To classify the different types of Tanjore district and to prepare a soil map of the tract.

(15) *Manures—All-India Scheme—Technical Co-operation Mission Scheme—Agronomic trials.*—To study the suitability of the imported fertilizers like urea, amophos, etc., for the paddy crop.

(16) *Soil survey—All India Scheme—Technical Co-operation Mission Scheme.*—To obtain a picture of the soil types occuring in South India.

Agricultural Entomology.

Researches will be continued on the insecticidal methods of control or paddy pests with the latest synthetic and systemic insecticides.

Researches will also be directed towards control of pests of vegetables, fruits, cotton, coconuts and stored produce.

Tests with soil insecticides, vegetable secticides and new proprietory products and chemicals will be done.

Adverse effects (especially phytoloxicity) of new chemical insecticides will be determined.

Biological control work in the cryptolaemus Montrouzieri and ot her parasites will be continned.

Systematic and fundamental research will be preserved as per three-year programme of work.

Agricultural Mycology.

I. *Studies of the Pythiaceous fungi.*—Studies on the mode of survival of the fungi and the control of the diseases caused by these will be continued. Investigations of new diseases caused by this group will also be taken up.

II. *Rice disease*—(*a*) *Blast.*—Further tests on the relative reaction of the varieties and cultures of rice evolved by the paddy specialist will be carried out.

(*b*) *Foot rot.*—Varietal resistance trials and testing of new fungicides in the control of this disease will be continued.

(*c*) *Stem rot.*—The varietal reaction of the various kuruvai varieties will be tested. The conditions favouring the incidence of this disease will be worked out.

III. *Ragi blast.*—Varietal resistance trials will be continued in collaboration with Millets and Pulses Specialist.

IV. *Cereal rusts*—(*a*) *Wheat rust.*—Varietal resistance trials and the search for collateral hosts to be continued.

(*b*) *Sorghum rust.*—Varietal resistance studies and search for alternate hosts will be continued.

(*c*) *Cumbu rust and* (*d*) *tenai rust.*—Varietal resistance studies and search for collateral hosts will be continued.

V. *Cotton black arm.*—Varietal studies and seed treatment experiments will be continued. Effect of spraying the crop with fungicides will be tested.

Cotton root rot.—Isolates of the causal organism from different localities to be studied. The reaction of different varieties of cotton under artificial inoculation will be studied. Study of the methods of control.

VI. *Vegetable diseases*—(*a*) *Fusariosis.*—Varietal resistance of brinjal varieties to be continued. Host range of the pathogen will be determined and fungicidal trials will be continued.

(*b*) *Root rot.*—Varietal resistance trials and fungicidal trials to be continued.

VII. *Orange diseases—Decline.*—Foliage sprays with urea and micro nutrients will be continued.

Limb breakage.—Studies on the account of limb breakage will be made.

VIII. *Banana wilt.*—Varietal resistant studies and studies on the different isolates of causal fungi will be continued. Soil application of fungicides will also be tried.

IX. *Ergot or rye.*—Large scale production of ergot and attempts to set up the alkaloid content as well as the acre yield of ergot will be continued.

X. *Stem breaking disease of arecanuts.*—The factors responsible for the stem breaking of areca will be investigated at Arecanut Research Station, Vittal.

Agricultural Meteorology.

The crop weather experiments will be continued. Collection of data on the incidence of pests and diseases with reference to weather conditions will be pursued. Statistical analysis of several factors of the weather and their effect on crops will be done.

Crop Improvement Work.

Paddy.

Improvement of local varieties by pure line selections.—Selection work in Mottakar, Bairuvadlu, Sembalai, Sonapalai, Seevan Samba, Koppasamba, Kaligan Samba, Vadan Samba of Chingleput, North and South Arcot districts, Paramban navara, Doodari for South Kanara district, Varigarudan Samba, Sembuli of Tirunelveli district and Tiruchengode Samba of Coimbatore district will be undertaken. Yield trials in the promising cultures of Pullasannavadlu, Thellasannavadlu, Mottakar, Sathikam, Chittada, Kesari, Malluga, Kaivari Samba, Kattaivellai, Kodaivellai, Mattai Kuruvai, Kattuvanam, Tiruthuraipoondikar, Maikuruvai, Seenganni, Banku, Arikkirai, Puluthipiratti, Jeeraga Samba will be laid out.

Varietal trials.—(*a*) Study of 15 Chinese types and other varieties and strains at Wynaad to fix up suitable varieties for the tract in Wynaad, the study of 11 short duration strains in Kuruvai season and three long duration strains in Samba and Thaladi at Aduthurai to introduce our station strains in the tract if found suitable and inter-varietal trial of promising cultures and strains will be continued at Mangalore.

(*b*) Varietal trial with exotic short duration Chinese varieties with Coimbatore, Aduthurai and Pattambi strains will be continued.

(*c*) Trial of D.S.I. of Swaziland, South Africa, reported to be suitable for all the three seasons of the year will be repeated.

II. Hybridization will be pursued as per three year programme of work.

III. *Fundamental work.*—Induction of mutations and production of economic polyploids will be undertaken. Further study of the mutants in Co. 13, GEB. 24 and Co. 2 induced by Acenapthene Benzene and ceresan for obtaining higher yielding strains than the existing ones will be continued.

IV. *Agronomic trials*—(1) *Manurial trials.*—The following manurial trials would be laid out :—

(*a*) Experiments to find out the best method of application of phosphate by 'placement' will be repeated.

(*b*) Experiments to find out the efficacy of 'placement' of ammonium sulphate using 30 lb. N. and 45 lb. N adopting two different spacings for planting will be done.

(*c*) (i) The confounded factorial experiment to test the merits of the Japanese Method of rice cultivation will be repeated.

(*ii*) The experiment to test the merits of the Japanese Method of rice cultivation as practised in Kora Cramodyog, Kendra, Bombay, will be laid out in all the eight stations.

(*d*) Experiments to find out the varietal response to manuring using two short, two medium and two long duration varieties with four levels of nitrogen and four levels of phospharic acid over a basal dressing of leaf will be conducted.

(*e*) Experiments to compare the relative merits of ammonium sulphate and chilean nitrate will be repeated.

(*f*) Co-ordinated set of manurial experiments on paddy.

(*g*) Application of sesbania speciosa as green versus application of air-dried and stacked sesbania.

(2) *Cultural trials.*—The following trials will be conducted :—

(*a*) Udu trials to find out the optimum seed proportion of the two component varieties and the economics of manuring ottadan after the harvest of kuruvai.

Millets and Pulses.

A. Cholam.—(*a*) Maintenance of types.

(*b*) Rainfed cholams—

(i) *Periamanjal cholam.*—Evolution of strains of periamanjal cholam superior to Co. 1 in grain yield and quality of straw..

(ii) Evolution of short duration strains for sowing in the late season (September-October) in Coimbatore district.

(iii) *Talaivirchan cholam.*—(1) Improvement of grain size and fodder quality by hybridization.

(2) Evolution of strains of Talaivirchan cholam suited to the West Coast.

(iv) *Irungu cholam.*—Improvement of size and colour of grain and quality of fodder.

(*c*) *Irrigated cholam*—(i) *Sen cholam.*—Improvement of grain size and quality of fodder.

(ii) *Chinnamanjal cholam.*—Evolution of high yielding strains with bold grain and juicy stalks.

(*d*) *Control of striga, root parasite of sorghum.*—Evolution of resistant strains (i) by selection, and (ii) by hybridization.

(*e*) Studies in the genetics of sorghum relationship between axil and sheath and axil juiciness.

(*f*) Agronomic experiments—

(i) Manurial experiments on rainfed cholams.

(ii) Mixed cropping and rotation experiments with millets and pulses (red soil) under rainfed conditions.

B. Ragi.—(i) Maintenance of types.

(ii) Evolution of short duration on ragi strain (90 days).

(iii) Evolution of selections suitable for the West Coast and the Nilgiris.

(iv) Evolution of strains of ragi resistant to *Piricularia.*

(v) *Fundamental studies.*—Study of the inheritance of reniform grain shape.

(vi) Age of ragi seedlings or the number of days from sowing the nurseries to transplanting the seedlings.

Hybrid Cumbu Scheme (*Indian Council of Agricultural Research*).—A. Collection and maintenance of pure cultures.

B. Multiplication and distribution of seeds of established strains.

C. *Evolution of hybrids and their yield studies.*—(i) Collection of samples and their study for utilization as parents of crosses.

(ii) Production of new hybrids.

(iii) Inbreeding.

(iv) Testing the hybrids for yield.

(v) Studies on the effect of diversity in the origin of parents on the vigour of the hybrids.

(vi) Study of the relationship between the yields of inbreds and their top-cross performance to the yield of the hybrids.

D. Trials of strains and hybrids in the fields of farmers in the districts.

E. *Agronomic experiments—Manurial experiments—*

(i) Rainfed cumbu.

(ii) Irrigated cumbu.

C. Tenai.—(1) Evolution of high yielding strains—

(*a*) A short duration strain of 85 days for dry land.

(*b*) Evolution of a strain better than Co. 1.

(*c*) Evolution of a strain better than Co. 2 (irrigated type).

(*d*) Evolution of rust resistant strains.

(2) *Fundamental Research.*—Study of tillering habit in tenai.

D. Minor millets—(*a*) *Varagu.*—Evolution of unirrigated strains.

(*b*) *Samai.*—Evolution of high yielding strains.

(*c*) *Panivaragu.*—Evolution of improved strains.

(*d*) *Kudiraivali.*—Evolution of high yielding strains.

E. Pulses.—(i) Evolution of high yielding strains for the State and multiplication and distribution of seed of improved strains of redgram, greengram, blackgram, horsegram, bengalgram and lablab-field varieties.

(ii) Study and maintenance of types of redgram, vegetable cowpeas, soyabeans and bean types.

(iii) Evolution of high yielding strains of cowpea grain types.

Cotton.

All the items of work that are half way through will be pursued during 1954–55. The work on irrigated Cambodia and unirrigated Karunganni will be continued for the evolution of American and *desi* types of cotton excelling the existing strains, Madras Cambodia Uganada-1 and Karunganni-5 in yield and adaptability and also in quality, if possible. The work on Nadam will be continued on a limited scale. Research work on perennial cottons and hybrids of wild cottons with cultivated types will continue to engage the serious attention. Fundamental studies will be pursued for the elucidation of the genetic behaviour of new characters. The studies on heterosis in inter-specific hybrids of annual and perennial types will be enlarged with a view to utilize the phenomenon in practical agriculture. The work of cultivation of cotton in rice fallows will be intensified when the scheme sanctioned for the purpose comes into operation. Grafting trials will be continued for the maintenance of delicate varieties and study of the response of graft plants to the adverse environment and incidence of diseases and pests.

Oil-seeds.

Groundnut.—Pure line selection, trial of new varieties, hybridization for evolving a dormant bunch type, a white seeded strain and a short duration type of A.S. 6481 will be pursued. Manurial and mixed cupping trials will be continued.

Gingelly.—Pure line selection, varietal trial, and hybridization work will be continued. Spacing and line sowing and studies in deterioration on storage will be continued.

Castor.—Selection and hybridization work will be continued.

Coconut.—Manurial and cultural varietal trials will be continued.

Trials with subsidiary crops and green manure plants will be continued.

Sugarcane.

Study of varieties in study plots and yield trials will be continued with new introductions from the Sugarcane Breeding Institute, Coimbatore. Trials with seasonal plantings, with pit system and with Rayangans will be continued. Green manure trials and with chilean nitrate will be pursued. Studies on lodging and jaggery making will be pursued as per technical programme approved by the Indian Central Sugarcane Committee.

Horticulture.

Fruits—Mango.—Hybridization will be continued.

Mandarin orange.—Trials with seedlings and clonal progenies and root-stock trials at Kallar and Wynaad will be continued.

Hill fruits.—Varietal collection trials in propagation and with different root-stocks, pruning and training with apples—peaches plum prunes, etc., will be continued. Trials with strawberry and annonaceous fruits will be continued. Jack, sapota, pineapples, papaya will also require attention.

Bananas.—Experiments as per technical programme approved by Indian Council of Agricultural Research will be carried on.

Cashew.—Experiments and research as per technical programme approved by Indian Council of Agricultural Research.

Vegetables.—The scheme sanctioned by Indian Council of Agricultural Research for research on vegetables will be taken up as per approved technical programme.

Pepper and tuber crops.—Research as per approved technical programme will be carried on.

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 non-legumes suitable for soil conservation purposes.

IV. *Essential oil yielding plants.*—Available species of *Cympopogon* 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. Chromomosome numbers of cultivated crops and their wild and allied species will be worked out.

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, Hari yali, Aristolochia Bacteata, Triathema Portulacastrum ana Spurrey.*

Viability and dormancy studies.—(*a*) The studies with Tetrazolem 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 Engineering (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 engine 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. Designing a bullock drawn pump for irrigation will be pursued.

General—Extension Work.

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, Nationl Extension Service Blocks will be maintained to ensure efficient progress. Agricultural Associations will be organized and all associations will be kept functioning. The extension staff in the districts will tour frequently and maintain close contact with farmers and carry out demonstrations, trials, 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 wil l 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.

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 seedings, 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 News letter and Press Notes will be continued as periodical features.

Exhibitions.

Exhibitions and shows will be organized at the districts at the time of festivals, fairs and shandies and demonstrations of improved implements and machinery and preservation of fruits will be conducted.

Agricultural Engineering (General).

The intensive cultivation engineering schemes will be continued to reach targets fixed. Supplies and services to agricultural machinery will be maintained.

Tractors.—Land reclamation with tractors and mechanical equipment, ploughing farmers' lands by tractors hired, supply of tractors on hire purchase basis, and supply of pumpsets will be continued. Trial with various agricultural implements and machinery will be continued.

Irrigation appliances.—Hiring of oil engine 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 (CAES).—Oil engines and electric 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 of Nilgiris to facilitate their farming profitably will be continued.

Colonization Schemes.

Work in the colonization scheme at Wynaad 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.

Soil conservation measures will be adopted on the Nilgiris and Coimbatore as per approved programme.

APPENDIX 43.

Appointments, postings and transfers of Gazetted Officers.

From 1st October 1953 to 30th June 1954 (After separation of Andhra State).

Post.	Period. From	Period. To	Name of the officer in charge.
(1)	(2)	(3)	(4)
	HEADQUARTERS.		
Director of Agriculture ..	(Throughout.)		M. S. Sivaraman, I.C.S.
Headquarters Deputy Director of Agrioulture (Engineering).	Do.		B. M. Lakshmipathy.
Headquarters Deputy Director of Agriculture (Inspection).	Do.		S. N. Venkataramana Ayyar.
Headquarters Deputy Director of Agriculture (Reserach).	Do.		Dr. K. C. Naik.
Personal Assistant to the Director of Agriculture.	1 Oct. 1953 ..	17 Oct. 1953 ..	E. S. Nagesan.
	18 Oct. 1953 ..	9 Mar. 1954 ..	V. Seetharama Servai.
	10 Mar. 1954 ..	30 June 1954 ..	W. G. Janakiraman.
Accounts Officer	(Throughout.)		K. Viswanathan Nair.
Junior Accounts Officer ..	Do.		T. Krishna Shetty.
Cane Development Officer ..	1 Oct. 1953 ..	31 Oct. 1953 ..	T. Natarajan.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period From	Period To	Name of the officer in charge.
(1)	(2)	(3)	(4)
	HEADQUARTERS—*cont.*		
Gazetted Assistant	1 Oct. 1953 ..	31 Oct. 1953 ..	T. K. Thangavelu.
	1 Nov. 1953 ..	20 Dec. 1953 ..	Post abolished.
	21 Dec. 1953 ..	15 May 1954 ..	T. Natarajan.
	16 May 1954 ..	2 June 1954 ..	T. K. Thangavelu.
	3 June 1954 ..	30 June 1954.	T. Natarajan.
State Marketing Officer ..	(Throughout)		V. Satagopan.
Assistant Marketing Officer.	1 Oct. 1953 ..	1 Mar. 1954 ..	D. Shanmugasundaram.
	2 Mar. 1954 ..	14 Mar. 1954 ..	T. Natarajan (Additional charge).
	15 Mar. 1954 ..	15 June 1954 ..	S. V. Doraiswami Iyer (additional charge).
	16 June 1954 ..	30 June 1954.	T. Natarajan (additional charge).
Assistant Agricultural Engineer, Headquarters I.	1 Oct. 1953 ..	31 Oct. 1953 ..	K. P. Sanjeeva Shetty.
	1 Nov. 1953 ..		Post abolished.
Assistant Agricultural Engineer, Headquarters II.	1 Oct. 1953 ..	11 Oct. 1953 ..	K. P. Sanjeeva Shetty (additional charge).
	12 Oct. 1953 ..	17 June 1954 ..	C. S. Sridharan.
	18th June 1954	30 June 1954..	T. Radhakrishnan.
Assistant Agricultural Engineer (CAES).	1 Oct. 1953 ..	1 Nov. 1953 ..	K. Natarajan.
	2 Nov. 1953 ..	17 June 1954.	T. Radhakrishnan.
	18 June 1954 ..	30 June 1954.	C. S. Sridharan.
Special Deputy Director of Agriculture (Crop Sampling).	1 Oct. 1953 ..	1 Nov. 1953 ..	A. Mohammed Ali.
	2 Nov. 1953 ..	20 Jan. 1954 ..	S. S. Katchapeswaran.
Senior District Agricultural Officer (Crop Sampling), Madras.	21 Jan. 1954 ..	9 Feb. 1954 ..	A. Mohammed Ali.
	10 Feb. 1954 ..	9 Mar. 1954 ..	Director of Statistics (additional charge).
	10 Mar. 1954 ..	4 May 1954 ..	T. S. Francis.
	5 May 1954 ..	16 May 1954 ..	N. G. Punja, Statistical Officer (additional charge).
	17 May 1954 ..	30 June 1954 ..	P. P. Syed Muhammed.
Special District Agricultural Officer (Crop Sampling), Madras.	1 Oct. 1953 ..	10 Oct. 1953 ..	K. Santhanam.
	11 Oct. 1953 ..	..	Post abolished.
	DISTRICTS.		
	Marketing Section.		
Assistant Marketing Officer, Tiruchirapalli.	(Throughout.)		K. Narayanan Nair.
Assistant Marketing Officer, Coimbatore.	1 Oct. 1953 ..	31 Mar. 1954 ..	C. Raman Moosad.
	1 Apr. 1954 ..	2 May 1954 ..	B. Srinivasa Rao.
	3 May 1954 ..	30 June 1954 ..	C. Raman Moosad.
	Agricultural College and Research Institute, Coimbatore.		
Principal	.. (Throughout.)		R. Balasubramanian.
Agronomist and Professor of Agriculture.	1 Oct. 1953 ..	2 May 1954 ..	P. A. Venkateswara Ayyar.
	3 May 1954 ..	15 May 1954 ..	A. H. Subramania Sarma (additional charge).
	16 May 1954 ..	30 June 1954 ..	P. A. Venkateswara Ayyar.
Lecturer in Agriculture ..	(Throughout.)		A. H. Subramania Sarma.
Lecturer in Animal Hygiene.	1 Oct. 1953 ..	2 Nov. 1953 ..	S. N. Vaidyanathan (additional charge).
	3 Nov. 1953 ..	30 June 1954.	S. Krishnaswami.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period From	Period To	Name of the officer in charge.
(1)	(2)	(3)	(4)
	DISTRICTS—*cont.*		
	Agricultural College and Research Institute, Coimbatore—cont.		
Lecturer in Agricultural Economics.	1 Oct. 1953 ..	20 Dec. 1953 ..	Dr. M. Srinivasan.
	21 Dec. 1953 ..	19 Jan. 1954 ..	S. V. Doraiswami Ayyar.
	20 Jan. 1954 ..	30 June 1954 ..	Dr. M. Srinivasan.
Lecturer in Entomology ..	1 Oct. 1953 ..	13 June 1954 ..	K. P. Ananthanarayanan (additional charge).
	14 June 1954 ..	17 June 1954	Do.
	18 June 1954 ..	30 June 1954 ..	S. Kanakaraj David.
Gazetted Assistant to Lecturer in Entomology.	1 Oct. 1953 ..	31 Oct. 1953 ..	S. Kanakaraj David.
	1 Nov. 1953 ..	4 Nov. 1953 ..	K. P. Ananthanarayan, (additional charge).
	5 Nov. 1953 ..	30 June 1954.	A. R. Seshadri.
Lecturer in Mycology ..	1 Oct. 1953 ..	4 Oct. 1953 ..	M. Kandaswami.
	5 Oct. 1953 ..	31 Oct. 1953 ..	C. V. Govindaswami.
	1 Nov. 1953 ..	15 Nov. 1953.	C. S. Krishnaswami.
	16 Nov. 1953 ..	30 June 1954 ..	M. Kandaswami.
Lecturer in Chemistry ..	1 Oct. 1953 ..	19 Feb. 1954 ..	M. R. Balakrishnan.
	20 Feb. 1954 ..	30 June 1954	M. Sundaram.
Gazetted Assistant to Lecturer in Chemistry.	1 Oct. 1953 ..	19 Feb. 1954 ..	M. Sundaram.
	20 Feb. 1954 ..	28 Feb. 1954	M. Sundaram (additional charge).
	1 Mar. 1954 ..	23 May 1954 ..	F. L. Daniel.
	24 May 1954 ..	30 June 1954 ..	Dr. A. Mariakulandai.
Systematic Botanist and Professor of Botany.	1 Oct. 1953 ..	16 Dec. 1953 ..	C. Rajasekhara Mudaliar.
	17 Dec. 1953 ..	31 Dec. 1953 ..	T. R. Narayana (additional charge).
	1 Jan. 1954 ..	9 Apr. 1954 ..	C. Rajasekhara Mudaliar.
	10 Apr. 1954 ..	30 June 1954 ..	T.R. Narayana (additional charge).
Lecturer in Botany	(Throughout.)		D. Daniel Sundaraj.
Lecturer in Civil Engineering.	1 Oct. 1953 ..	10 Oct. 1953 ..	B. K. Sadasiva Rao.
	11 Oct. 1953 ..	8 Nov. 1953.	N. Sankaranarayana Reddy.
	9 Nov. 1953 ..	19 Feb. 1954 ..	Leo Swamikan (Supervisor) (additional charge).
	20 Feb. 1954 ..	30 June 1954 ..	N. Sankaranarayana Reddy.
Lecturer in Mechanical Engineering.	1 Oct. 1953 ..	31 Oct. 1953 ..	S. Gonsalvas.
	1 Nov. 1953 ..	13 June 1954.	J. P. Walter Devasahayam
	14 June 1954 ..	15 June 1954.	C. Venkatanarasimham (additional charge).
	16 June 1954	16 June 1954.	J. P. Walter Devasahayam
	17 June 1954 ..	30 June 1954	C. Venkatanarasimham.
Cytogeneticist	(Throughout.)		Dr. N. Krishnaswami.
Cytogeneticist, Bapatla, at Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	Dr. N. Krishnaswami (additional charge).
Plant Physiologist	(Throughout.)		T. R. Narayanan.
Superintendent, Central Farm.	Do.		K. Ramaswami Ayyar.
	RESEARCH SECTION.		
	Paddy Section.		
Paddy Specialist	1 Oct. 1953 ..	31 Oct. 1953 ..	A. Abdul Samad (additional charge).
	1 Nov, 1953 ..	8 Dec. 1953 ..	C. Balasubramaniam (additinal charge).
	9 Dec. 1953 ..	20 June 1954 ..	A. Abdul Samad.
	21 June 1954 ..	30 June 1954.	K. Ramaswami.
Agricultural Meteorologist ..	(Throughout).		C. Balasubramaniam.

Appointments, postings and transfers of Gazetted Officers—cont.

Post. (1)	Period From (2)	Period To (3)	Name of the officer in charge. (4)
	RESEARCH SECTION—*cont.*		
	Paddy Section—cont.		
Assistant Paddy Specialsit, Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	A. Abdul Samad.
	1 Nov. 1953	..	Post abolished.
Assistant Paddy Specialist, Pattambi.	1 Oct. 1953 ..	31 Oct. 1953 ..	P. Uttaman.
	1 Nov. 1953	26 Mar. 1954 ..	Post abolished.
	27 Mar. 1954 ..	30 June 1954 ..	(Post revived) V. Srinivasan.
	Cotton Section.		
Cotton Specialist	(Throughout.)		S. M. Kalyanaraman.
Assistant Cotton Specialist, Coimbatore.	1 Oct. 1953 ..	14 Feb. 1954 ..	R. V. Rangaswami.
	15 Feb. 1954 ..	30 June 1954 ..	V. Santhanam.
Assistant Cotton Specialist, Tiruppur.	(Throughout.)		A. Raghavan.
Assistant Cotton Specialist, Srivilliputtur.	1 July 1953 ..	23 Feb. 1954..	C. K. Ramachandran.
	24 Feb. 1954 ..	30 June 1954 ..	N. G. Narayanan.
Assistant Cotton Specialist, Karunganni Scheme, Koilpatti.	(Throughout.)		L. Neelakantan.
Assistant Cotton Specialist, K-2 and Co. 4 Scheme, Koilpatti.	1 Oct. 1953 ..	7 Dec. 1953 ..	S. Mayandi Pillai.
	8 Dec. 1953 ..	7 Feb. 1954 ..	L. Neelakantan (additional charge).
	8 Feb. 1954 ..	1 Mar. 1954 ..	S. Mayandi Pillai.
	2 Mar. 1954 ..	30 June 1954 ..	C. K. Ramachandran.
Assistant Cotton Specialist, Winter Cambodia Scheme, Coimbatore.	1 Oct. 1953 ..	2 May 1954 ..	V. Ramaswami
	3 May 1954 ..	30 June 1954 ..	T. V. Rangaswami.
Certification Officer, Rajapalayam.	1 Oct. 1953 ..	8 Mar. 1954 ..	P. N. Krishnaswami.
	9 Mar. 1954 ..	30 June 1954 ..	S. Mayandi Pillai.
Gazetted Assistant to Certification Officer, Rajapalayam.	1 Oct. 1953 ..	5 Feb. 1954 ..	R. Kannian.
	6 Feb. 1954 ..	15 Feb. 1954 ..	N. G. Narayanan.
	16 Feb. 1954 ..	8 Mar. 1954.	P. N. Krishnaswami (additional charge).
	9 Mar. 1954 ..	30 June 1954 ..	P. N. Krishnaswami.
Cotton Extension Officer, Coimbatore.	1 Oct. 1953 ..	15 Nov. 1953 ..	M. Kesava Ayyangar (additional charge).
	16 Nov. 1953	30 June 1954 ..	M. A. Sankara Ayyar.
Assistant Cotton Extension Officer, Coimbatore.	(Throughout.)		N. Kesava Ayyangar.
Assistant Cotton Extension Officer, Madurai.	1 Oct. 1953 ..	10 Apr. 1954 ..	R. Krishnamurthy.
	11 Apr. 1954 ..	30 June 1954 ..	Dr. P. Abraham.
	Millets Section.		
Millets Specialist	1 Oct. 1953 ..	15 Nov. 1953 ..	M. A. Sankara Ayyar (additional charge).
	16 Nov. 1953	17 Jan. 1954 ..	A. Kunhikoran Nambiar (additional charge).
	18 Jan. 1954 ..	30 June 1954 ..	V. Gomathinayagam Pillai.
Assistant Millet Specialist, Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	A. Kunhikoran Nambiar.
	1 Nov. 1953 ..	15 Nov. 1953.	M. A. Sankara Ayyar.
	16 Nov. 1953 ..	30 June 1954 ..	A. Kunhikoran Nambiar.
	1 Oct. 1953 ..	30 June 1954 ..	P. Krishnaswami.
	1 Nov. 1953 ..	..	Post abolished.

Appointments, postings and transfers of Gazetted Officers—cont.

Post. (1)	Period From (2)	Period To (3)	Name of the officer in charge. (4)
	RESEARCH SECTION—*cont.*		
	Oilseeds Section.		
Oilseeds Specialist	(Throughout.)		C. R. Seshadri.
Assistant Oilseeds Specialist, Coimbatore.	Do.		S. G. Ayyadurai.
Assistant Oilseeds Specialist, (Nucleus Seed Farm Scheme).	1 Oct. 1953 ..	31 Oct. 1953 ..	S. Varisai Muhammed.
	1 Nov. 1953 ..	....	Post abolished.
Superintendent, Agricultural Resrach Station, Tindivanam.	(Throughout.)		M. Bhavanishankar Rao.
Superintendent, Agricultural Research Station, Nileshwar.	Do.		P. M. Sayeed.
Cardamom Specialist ..	1 Oct. 1953 ..	24 Nov. 1953 ..	C. R. Seshadri (additional charge).
	25 Nov. 1953 ..	31 Mar. 1954 ..	Dr. P. Abraham.
	1 Apr. 1954 ..	..	Post abolished.
Pepper Specialist	1 Oct. 1953 ..	23 Nov. 1953 ..	P. Govindakutty Kurup.
	24 Nov. 1953 ..	15 Mar. 1954 ..	P. C. Sahadevan (additional charge).
	16 Mar. 1954 ..	30 June 1954 ..	P. Govindakutty Kurup.
	Horticultural Section.		
Horticulturist and Professor of Horticulture, Coimbatore.	(Throughout.)		U. Narasinga Rao.
Assistant Fruit Specialist, Coimbatore (Horticulture).	1 Oct. 1953 ..	7 Aprl. 1954 ..	U. Narasinga Rao (additional charge).
	8 Apr. 1954 ..	30 June 1954 ..	J. Samuel Sundararaj.
Assistant Fruit Specialist (Orchard-cum-Nurseries), Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	U. Narasinga Rao, (additional charge).
	1 Nov. 1953 ..	....	Post abolished.
Assistant Fruit Specialist, Coonoor.	(Throughout.)		K. Fazlullakhan.
Banana Research Officer, Aduthurai.	1 Oct. 1953 ..	3 May 1954 ..	T. Gopalan Nair.
	4 May 1954 ..	18 June 1954 ..	K. Ramaswami (additional charge).
	19 June 1954 ..	30 June 1954 ..	T. Gopalan Nair.
Assistant Fruit Specialist (Cashewnut) Mangalore.	(Throughout.)		V. N. Madhava Rao.
	Botany Section.		
Systematic Botanist and Professor of Botany.	1 Oct. 1953 ..	16 Dec. 1953 ..	C. Rajasekhara Mudaliar.
	17 Dec. 1953 ..	31s Dec. 1953..	T.R. Narayanan (additional charge).
	1 Jan. 1954 ..	9 Apr. 1954 ..	C. Rajasekhara Mudaliar.
	10 Apr. 1954 ..	30 June 1954	T.R. Narayanan (additional charge).
Lecturer in Botany	(Throughout).		D. Daniel Sundararaj.
Systematic Botanist, Aduthurai.	1 Oct. 1953 ..	31 Mar. 1954 ..	J. Samuel Sundararaj.
	1 Apr. 1954 ..	....	Post abolished.
	Sugarcane Section (Superintendents, Sugarcane Liaison Farms).		
Superintendent, Sugarcane Liaison Farm, Kulittalai.	(Throughout.)		S. Ramaswami Ayyar.
Superintendent, Sugarcane Liaison Farm, Nellikuppam.	1 Oct. 1953 ..	29 May 1954 ..	V. K. Appaji.
	30 May 1954 ..	30 June 1954 ..	C. Ekambaram.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period. From	Period. To	Name of the officer in charge.
(1)	(2)	(3)	(4)
	RESEARCH SECTION—*cont.*		
	Chemistry Section.		
Government Agricultural Chemist.	1 Oct. 1953 ..	19 Feb. 1954 ..	M. R. Balakrishnan (additional charge).
	20 Feb. 1954 ..	30 June 1954 ..	T. Rajagopala Ayyangar (additional charge).
Agricultural Bacteriologist ..	(Throughout.)		T. Rajagopala Ayyangar.
Soil Physicist	1 Oct. 1953 ..	31 Oct. 1953 ..	F. L. Daniel.
	1 Nov. 1953 ..	....	Post abolished.
Assistant Agricultural Chemist, Coimbatore.	1 Oct. 1953 ..	23 May 1954 ..	G. K. Chidambaram.
	24 May 1954 ..	30 June 1954 ..	F. L. Daniel.
Assistant Agricultural Chemist, Tanjore.	1 Oct. 1953 ..	31 Oct. 1953 ..	C. Raghavendrachar.
	1 Nov. 1953 ..	20 Feb. 1954 ..	F. L. Daniel.
	21 Feb. 1954 ..	30 June 1954 ..	C. Raghavendrachar.
	Entomology Section.		
Government Entomologist ..	1 Oct. 1953 ..	13 June 1954 ..	K. P. Ananthanarayana (additional charge).
	14 June 1954 ..	30 June 1954.	K. P. Ananthanarayanan.
Assistant Entomolist, Coimbatore.	1 Octo. 1953..	31 Oct. 1953 ..	P. S. Narayanaswami.
	1 Nov. 1953 ..	....	Post abolished.
Assistant Entomologist (Sugarcane Scheme), Coimbatore.	(Throughout.)		Mohammad Basheer.
Agriculturist	1 Oct. 1953 ..	4 Apr. 1954.	M. S. Subbiah.
	5 Apr. 1954.	5 May 1954 ..	K. P. Ananthanarayana (Additional charge).
	6 May 1954 ..	30 June 1954.	M. S. Subbiah.
	Mycology Section.		
Government Mycologist ..	(Throughout.)		T. S. Ramakrishnan.
Assistant Mycologist (Ergot Scheme), Ootacamund.	1 Oct. 1953 ..	30 Nov. 1953.	K. V. Srinivasan.
	1 Dec. 1953 ..	3 May 1954 ..	C. S. Krishnamurthy.
	4 May 1954 ..	30 June 1954 ..	C. V. Govindaswami.
	Crop and Plant Protection Officers.		
Crop and Plant Protection Officer (Mycology), Coimtore.	1 Oct. 1953 ..	4 Octo. 1953.	N. R. Adyanthiah.
	5 Oct. 1953 ..	15 Nov. 1953.	C. S. Krishnamurthy.
	16 Nov. 1953.	30 June 1954.	C. S. Krishnaswamy Ayya
Crop and Plant Protection Officer (Entomology, Coimbatore).	1 Oct. 1953 ..	4 Oct. 1953 ..	E. R. Gopala Menon.
	5 Oct. 1953 ..	4 Nov. 1953.	A. R. Seshadri.
	5 Nov. 1953.	14 May 1954 ..	E. R. Gopala Menon.
	15 May 1954 ..	30 June 1954.	C. S. Balasubramaniam.
	Agricultural Research Engineering Section.		
Assistant Agricultural Engineer (Research), Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	J. P. Walter Devasahayam.
	1 Nov. 1953.	30 June 1954.	R. Govinda Menon.
Gazetted Assistant to Assistant Agricultural Engineer (Research), Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	R. Govinda Menon.
	1 Nov. 1953.	....	Post abolished.

Appointments, postings and transfers of Gazetted Officers—cont.

Post.	Period. From	Period. To	Name of the officer in charge.
(1)	(2)	(3)	(4)
	RESEARCH SECTION—*cont.*		
	Vellore Division.		
Deputy Director of Agriculture.	1 Oct. 1953 ..	15 Jan. 1954 ..	G. Sakharama Rao.
	16 Jan. 1954 ..	28 Jan. 1954 ..	M. Obeidullah Shah (Additional charge).
	29 Jan. 1954 ..	23 May 1954 ..	S. S. Katchapeswaran.
	24 May 1954 ..	30 June 1954.	K. Varadachari.
District Agricultural Officer, Vellore.	(Throughout)		S. V. Ramachandran.
District Agricultural Officer, Salem.	Do.		N. Krishna Pillai.
District Agricultural Officer, Guindy.	1 Oct. 1953 ..	3 June 1954.	B. Santhanakrishna Naidu.
	4 June 1954.	30 June 1954.	T. K. Thangavelu.
Superintendent, Agricultural Research Station, Tirurkuppam.	1 Oct. 1953 ..	5 April 1954.	M. K. Venkatasubramaniam.
	6 Apr. 1954 ..	5 May 1954 ..	K. Dorairaj (additional charge).
	6 May 1954 ..	30 June 1954.	M. K. Venkatasubramaniam.
Seed Development Officer (Paddy), Vellore.	1 Oct. 1953 ..	25 Oct. 1953 ..	N. C. Thirumalacharya.
	26 Oct. 1953 ..	8 Nov. 1953 ..	V. Srinivasan.
	9 Nov. 1953.	11 Dec. 1953 ..	A. Abdul Samad.
	12 Dec. 1953 ..	8 Jan. 1954 ..	V. Srinivasan.
	9 Jan. 1954 ..	4 Apr. 1954 ..	P. Uttaman.
	5 Apr. 1954 ..	22 Apr. 1954 ..	S. S. Katchapeswaran (additional charge).
	23 Apr. 1954 ..	8 June 1954 ..	P. Uttaman.
	9 June 1954.	23 June 1954 ..	P. C. Sahadevan.
	24 June 1954.	30 June 1954 ..	P. Uttaman.
Assistant Agricultural Engineer (Inspection), Vellore.	(Throughout).		A. K. Subramaniam.
	Tanjore Division.		
Deputy Director of Agriculture.	1 Oct. 1953 ..	17 May 1954 ..	K. Varadachari.
	18 May 1954.	30 June 1954.	A. Mohammed Ali.
District Agricultural Officer, Tanjore.	(Throughout)		N. V. Kalyanasundaram.
District Agricultural Officer, Pattukottai.	Do.		M. J. David.
District Agricultural Officer, Cuddalore.	Do.		S. Muthuswami Ayyar.
District Agricultural Officer, Tiruchirappalli.	Do.		K. H. Subramania Ayyar.
Additional District Agricultural Officer (Manuring Scheme), Tanjore.	1 Oct. 1953 ..	28 Oct. 1953 ..	M. Vaidyanathan.
	29 Oct. 1953 ..	30 Nov. 1953.	P.S. Venkatasubramaniam.
	1 Dec. 1953 ..	7 June 1954.	Scheme closed.
	8 June 1954.	30 June 1954.	K. C. Thomas.
Additional District Agricultural Officer (Manuring Scheme), Tiruchirappalli.	1 Oct. 1953 ..	19 Nov. 1953.	L. Krishnan.
	20 Nov. 1953.	31 Dec. 1953 ..	K. Santhanam.
	1 Jan. 1954 ..	..	Scheme closed.
Additional District Agricultural Officer (Manuring Scheme), Pattukottai.	1 Oct. 1953 ..	4 Oct. 1953 ..	P. K. Nambiar.
	5 Oct. 1953.	30 Nov. 1953.	T. S. Francis.
	1 Dec. 1953 ..	13 June 1954.	Scheme closed.
	14 June 1954.	30 June 1954.	N. Ganesamurthy.

Appointments, postings and transfers of Gazetted Officers—cont.

Post. (1)	Period. From (2)	To (3)	Name of the officer in charge. (4)
	RESEARCH SECTION—*cont.*		
	Tanjore Division—cont.		
Special District Agricultural Officer (Crop Sampling), Tanjore.	1 Oct. 1953 ..	1 Dec. 1953 ..	E. G. Sivaswamy.
	2 Dec. 1953 ..	20 May 1954 ..	P. S. Venkatasubramaniam.
	21 May 1954 ..	22 June 1954.	M. Vaidyanathan.
	23 June 1953.	30 June 1954.	N. V. Kalyanasundaram (additional charge).
Superintendent, Agricultural Research Station, Palur.	1 Oct. 1953 ..	19 June 1954 ..	M. Rayappa Pillai.
	20 June 1954.	29 June 1954 ..	W. R. Nargunam (additional charge).
Superintendent, Agricultural Research Station, Aduthurai.	30 June 1954	30 June 1954.	A. Abdul Samad.
	1 Oct. 1953 ..	16 Nov. 1953.	K. Ramaswami.
	17 Nov. 1953.	16 Jan. 1954 ..	T. Gopalan Nair (additional charge).
	17 Jan. 1954.	20 June 1954.	K. Ramaswami.
	21 June 1954.	30 June 1954 ..	K. Ramaswami (additional charge).
Seed Development Officer (Paddy), Tanjore.	(Throughout).		V. Krishnaswami.
Assistant Agricultural Engneer (Inspection), Tiruchirappalli.	1 Oct. 1953 ..	10 Mar. 1954 ..	C. R. Subramaniam.
	11 Mar. 1954 ..	30 June 1954.	M. Umapathy.
	Madurai Division.		
Deputy Director of Agriculture.	1 Oct. 1953 ..	13 Feb. 1954 ..	K. Venkataraman.
	14 Feb. 1954 ..	11 May 1954 ..	A. Mohammed Ali.
	12 May 1954 ..	30 June 1954.	T. S. Francis.
District Agricultural Officer, Madurai.	1 Oct. 1953 ..	23 Oct. 1953 ..	K. S. Krishnamurthy.
	24 Oct. 1953 ..	10 Nov. 1953	K. V. Natesan (additional charge).
	11 Nov. 1953.	8 Jan. 1954 ..	K. V. Natesan.
	9 Jan. 1954 ..	22 Feb. 1954 ..	K. Santhanam.
	23 Feb. 1954 ..	23 Feb. 1954 ..	K. Santhanam (additional charge).
	24 Feb. 1954 ..	31 Mar. 1954 ..	K. S. Krishnamurthy.
	1 Apr. 1954 ..	19 May 1954 ..	T. N. Balasubramaniam.
	20 May 1954 ..	23 May 1954 ..	P. Gopalakrishnan (additional charge).
	24 May 1954 ..	30 June 1954 (Throughout)	P. S. Venkatasubramaniam.
District Agricultural Officer, Sattur.	Do.		A. K. Ramasubba Ayyar.
District Agricultural Officer, Tirunelveli.	1 Oct. 1953 ..	4 Oct. 1953 ..	N. S. Rajagopalan.
Additional District Agricultural Officer (Manuring Scheme), Madurai.	5 Oct. 1953 ..	8 Oct. 1953 ..	K. C. Thomas.
	9 Oct. 1953 ..	25 Nov. 1953.	U. B. Mohammed Abbas.
	26 Nov. 1953.	1 Dec. 1953 ..	A. K. Annaswami Ayyar.
	2 Dec. 1953 ..	31 Dec. 1953 ..	K. V. Natesa Ayyar (additional charge).
	1 Jan. 1954 ..	17 June 1954	L. Krishnan.
	18 June 1954 ..	30 June 1954.	Scheme closed.
Additional District Agricultural Officer (Manuring Scheme), Tirunelveli.	1 Oct. 1953 ..	31 Dec. 1953 ..	R. Krishnamurthy.
	1 Jan. 1954 ..	..	T. N. Balasubramaniam.
			Scheme closed.

Appointments, postings and transfers of Gazetted Officers—cont.

Post. (1)	Period. From (2)	To (3)	Name of the officer in charge. (4)
	RESEARCH SECTION—*cont.*		
	Madurai Division—cont.		
Special District Agricultural Officer (Crop Sampling), Madurai.	1 Oct. 1953 ..	10 Nov. 1953	K. V. Natesa Ayyar.
	11 Nov. 1953.	22 Feb. 1954 ..	K Raman Menon.
	23 Feb. 1954	12 June 1954 ..	K. Santhanam.
	13 June 1954	30 June 1954.	B. P. Masilamani.
Superintendent, Agricultural Research Station, Koilpatti.	(Throughout)		B. W. X. Ponnayya.
Assistant Agricultural Engineer (Inspection), Madurai.	1 Oct. 1953 ..	7 Feb. 1954 ..	R. S. Subramaniam.
	8 Feb. 1954 ..	5 Mar. 1954 ..	M. Umapathy.
	6 Mar. 1954 ..	30 June 1954.	R. S. Subramaniam
	Coimbatore Division.		
Deputy Director of Agriculture.	1 Oct. 1953 ..	25 Oct. 1953 ..	S. S. Katchapeswaran.
	26 Oct. 1953 ..	30 June 1954.	Mohammed Obeidulla Shah.
District Agricultural Officer, Coimbatore.	1 Oct. 1953 ..	1 Dec. 1953 ..	J. H. S. Ponnayya.
	2 Dec. 1953 ..	20 Dec. 1953 ..	S. V. Doraiswami Ayyar.
	21 Dec. 1953.	31 Dec. 1953 ..	M. Kasiviswanathan (additional charge).
	1 Jan. 1954 ..	30 June 1954	J. H. S. Ponnayya.
District Agricultural Officer, Shoranur.	(Throughout)		K. Krishnan.
District Agricultural Officer, Tellicherry.	1 Oct. 1953 ..	19 Mar. 1954 ..	K. Sanjeeva Shetty.
	20 Mar. 1954 ..	30 June 1954.	P. K. Parameswara Menon.
District Agricultural Officer, Mangalore.	1 Oct. 1953 ..	3 Mar. 1954 ..	P. N. Nayar.
	4 Mar. 1954 ..	24 Mar. 1954 ..	U. Ananda (additional charge).
	25 Mar. 1954 ..	30 June 1954.	K. Sanjeeva Shetty.
District Agricultural Officer, Ootacamund.	1 Oct. 1953 ..	2 Oct. 1953 ..	M. Mukundan.
	2 Oct. 1953 ..	8 Dec. 1953 ..	S. M. Sulaiman.
	9 Dec. 1953 ..	28 Feb. 1954 ..	T. S. Francis.
	1 Mar. 1954 ..	30 June 1954 ..	K. Raman Menon.
Curator, Ootacamund ..	1 Oct. 1953 ..	16 Dec. 1953 ..	B. G. Narayana Menon.
	17 Dec. 1953 ..	8 Jan. 1954 ..	Vacant.
	9 Jan. 1954 ..	28 Feb. 1954 ..	T. S. Francis (additional charge).
	1st Mar. 1954.	1 Apr. 1954 ..	K. Raman Menon.
	2 Apr. 1954 ..	30 June 1954.	B. G. Narayana Menon.
Special District Agricultural Officer (Crop sampling), Shoranur.	1 Oct. 1953 ..	10 May 1954 ..	P. P. Syed Mohammad.
	11 May 1954 ..	30 June 1954	B. Srinivasa Rao.
Superintendent, Agricultural Research Station, Nanjanad.	(Throughout)		K. Saptharishi.
Superintendent, Wynaad ..	1 Oct. 1953 ..	4 Oct. 1953 ..	P. K. Natesan (additional charge).
	5 Oct. 1953 ..	23 June 1954.	M. Mukundan.
	24 June 1954.	30 June 1954.	P. K. Natesan (additional charge).
Superintendent, Agricultural Research Station, Mangalore.	(Throughout)		K. Hanumantha Rao.
Seed Development Officer (Millets), Coimbatore.	1 Oct. 1953 ..	31 Oct. 1953 ..	U. Atchuytha Warrier.
	1 Nov. 1953. ..	15 Nov. 1953.	A. Kunhikoran Nambiar.
	16 Nov. 1953.	15 Apr. 1954 .	U. Atchyutha Warrier.
	16 Apr. 1954 ..	30 June 1954.	G. Ramabadran.

Appointments, postings and transfers of Gazetted Officers—cont.

Post. (1)	Period From (2)	Period To (2)	Name of the officer in charge. (4)
	RESEARCH SECTION—*cont.*		
	Coimbatore Division—cont.		
Assistant Agricultural Engineer (Soil Conservation Scheme), Ootacamund.	(Throughout)		S. Narayanaswamy.
Assistant Agricultural Engineer (Tractor Workshop), Coimbatore.	1 Oct. 1953 ..	9 Dec. 1953 ..	M. Umapathy.
	10 Dec. 1953 ..	30 June 1954.	K. Natarajan.
Assistant Agricultural Engineer (Groundnut Scheme), Coimbatore).	1 Oct. 1953 ..	25 Oct. 1953 ..	A. M. Mahommed Ali.
	26 Oct. 1953.	30 June 1954	T. S. Palanivelu.
Agronomist, Satyamangalam.	(Throughout)		S. Sundaram.

OFFICERS WHO WERE ON LEAVE DURING THE YEAR.

Name.	Period From	Period To
P. Uttaman	1 Nov. 1953 ..	31 Nov. 1953.
	5 Apr. 1954 ..	22 Apr. 1954.
	9 June 1954 ..	23 June 1954.
Dr. P. Abraham	25 Sep. 1953 ..	14 Nov. 1953.
U. Atchutha Warrier	16 Apr. 1954 ..	30 June 1954.
C. Annamalai	30 July 1953 ..	30 Sep. 1953.
V. K. Appaji	30 May 1954 ..	30 June 1954.
R. Alagiamanavalan	25 Sep. 1953 ..	23 Nov. 1953.
K. Brahmachari	1 Oct. 1953 ..	30 Nov. 1953.
G. K. Chidambaram	25 Apr. 1954 ..	17 June 1954.
S. V. Doraiswami Ayyar	1 Oct. 1953 ..	30 Nov. 1953.
	20 Jan. 1954 ..	6 Mar. 1954.
T. S. Francis	1 July 1953 ..	2 July 1953.
V. Gomathinayagam Pillai	21 Sep. 1953 ..	18 Jan. 1954.
E. R. Gopala Menon	5 Oct. 1953 ..	4 Nov. 1953.
	15 May 1954 ..	Up to date.
T. Gopalan Nair	4 May 1954 ..	18 June 1954.
R. Govinda Menon	1 Aug. 1953 ..	30 Sep. 1953.
P. Govindakutty Kurup	24 Nov. 1953 ..	15 Mar. 1954.
C. Jagannatha Rao	25 Sep. 1953 ..	30 Sep. 1953.
M. Kandaswami	5 Oct. 1953 ..	15 Nov. 1953.
S. S. Katchapeswara Ayyar	24 May 1954 ..	30 June 1964.
B. Santhanakrishnan	4 June 1954 ..	3 July 1954.
C. S. Krishnamurthy	4 May 1954 ..	1 Aug. 1954.
K. S. Krishnamurthy	7 Sep. 1953 ..	30 Sep. 1953.
	24 Oct. 1953 ..	23 Feb. 1954.
S. Mayandi Pillai	1 Apr. 1954. ..	31 July 1954.
U. B. Mohammed Abbas	8 Dec. 1953 ..	7 Feb. 1954.
A. Mohammed Ali	1 July 1953 ..	16 July 1953.
Mohammed Kasim Adeni	2 Nov. 1953 ..	20 Jan. 1954.
Mohammed Obeidullah Shah	1 Sep. 1953 ..	11 Sep. 1953.
S. M. Sulaiman	21 July 1953 ..	18 Oct. 1953.
T. Natarajan	1 July 1953 ..	21 Aug. 1954.
	1 Nov. 1953 ..	20 Dec. 1953.
K. Natarajan	16 May 1954 ..	2 June 1954.
T. S. Palanivelu	2 Nov. 1953 ..	1 Dec. 1953.
	25 Sep. 1953 ..	

OFFICERS WHO WERE ON LEAVE DURING THE YEAR—*cont.*

Name.	Period From	Period To
S. V. Parthasarathy	1 July 1953 ..	23 July 1953.
	23 Sep. 1953 ..	23 Nov. 1953.
T. Radhakrishnan	25 Sep. 1953 ..	24 Oct. 1953.
C. Rajasekhara Mudaliar	17 Dec. 1953 ..	31 Dec. 1953.
	10 Apr. 1954 ..	31 July 1954.
M. Ramamurthy	1 July 1953 ..	15 July 1953.
K. Ramaswami	17 Nov. 1953 ..	16 Jan. 1954.
S. Ramaswami Ayyar	1 July 1953 ..	11 Sep. 1953.
V. Ramaswami Mudaliar	3 May 1954 ..	30 Aug. 1954.
T. V. Rangaswami	15 Feb. 1954 ..	2 May 1954.
N. Sankaranarayana Reddy	9 Nov. 1953 ..	19 Feb. 1954.
K. Santhanam	11 Oct. 1953 ..	11 Nov. 1953.
M. Sanyasi Raju	25 Sep. 1953 ..	30 Sep. 1953.
P. Satyanarayana	1 Sep. 1953 ..	30 Sep. 1953.
G. Seetharamiah	10 Sep. 1953 ..	30 Sep. 1953.
D. Shanmugasundaram	2 Mar. 1954 ..	To-date.
E. G. Sivaswami	1 July 1953 ..	20 July 1953.
K. V. Srinivasan	4 Jan. 1954 ..	23 Jan. 1954.
C. S. Sridharan	27 July 1953 ..	4 Oct. 1953.
M. S. Subbaiah	5 Apr. 1954 ..	5 May 1954.
R. S. Subramaniam	1 July 1953 ..	18 July 1953.
V. Suryanarayana	28 Aug. 1953 ..	27 Sep. 1953.
V. Thirumala Rao	25 Sep. 1953 ..	30 Sep. 1953.
M. Uampathy	14 Sep. 1953 ..	26 Sep. 1953.
	10 Dec. 1953 ..	30 Jan. 1954.
G. Venkatanarayana	30 July 1953 ..	10 Sep. 1953.
K. Venkataraman	14 Feb. 1954 ..	13 June 1954.
M. K. Venkatasubramaniam	6 Apr. 1954 ..	5 May 1954.
P. A. Venkateswara Ayyar	3 May 1954 ..	15 May 1954.
J. P. Walter Devasahayam	14 June 1954 ..	15 June 1954.
C. Raman Moosad	1 Apr. 1954 ..	2 May 1954.
T. N. Balasubramaniam	1 Jan. 1954 ..	31 Mar. 1954.
Dr. M. Srinivasan	21 Dec. 1953 ..	19 Jan. 1954.
P. S. Venkatasubramaniam	1 July 1953 ..	28 Oct. 1953.
J. H. S. Ponnayya	2 Dec. 1953. ..	31 Dec. 1953.
M. Rayappa Pillai	20 June 1954 ..	19 Oct. 1954.
R. Krishnamurthy	11 Apr. 1954 ..	17 June 1954.
A. K. Annaswami	26 Nov. 1953 ..	13 Dec. 1953.
P. Rajavadan	1 Apr. 1954 ..	13 Apr. 1954.
M. Subramania Chetty	25 Sep. 1953 ..	24 Oct. 1953.
G. Ramabhadran	26 Aug. 1953 ..	13 Sep. 1953.
	25 Sep. 1953 ..	24 Oct. 1953.
T. K. Thangavelu	1 Nov. 1953 ..	19 Nov. 1953.
	2 Dec. 1953 ..	31 Dec. 1953.
B. G. Narayana Menon	17 Dec. 1953 ..	1 Apr. 1954.

APPENDIX 44.

Strength of Staff of Agricultural Department as on 30th June 1954 (Gazetted).

HEADQUARTERS ESTABLISHMENT.

Serial number and name of post. (1)	Permanent. (2)	Temporary. (3)
1 Director of Agriculture	1	..
2 Headquarters Deputy Director of Agriculture (Rsearch)	1	..
3 Headquarters Deputy Director of Agriculture (Inspection and General).	..	1
4 Headquarters Deputy Director of Agriculture (Engineering)	1	..
5 Personal Assistant to the Director of Agriculture	1	..
6 Assistant Marketing Officer	1	..
7 Accounts Officer	1	..
8 Junior Accounts Officer	..	1
9 Assistant Agricultural Engineer (Headquarters)	..	1
10 Assistant Agricultural Engineer, Central Agricultural Engineering Stores.	..	1

OTHER ESTABLISHMENTS.

Regional—		
1 State Marketing Officer	1	..
2 Regional Deputy Directors of Agriculture	3	1 *
* Post at Madurai.		
3 District Agricultural Officers	14	1 †
† Post of District Agricultural Officer, North Malabar at Tellicherry.		
4 Assistant Marketing Officers, Coimbatore and Tiruchirappalli	2	..
5 Seed Development Officers (2 for Paddy and 1 for millets)	..	3
6 Assistant Agricultural Engineers (Inspection) (Vellore, Tiruchirappalli and Madurai).	..	3
7 Crop and Plant Protection Officers (Entomology and Mycology)	..	2
Agricultural College—		
1 Principal	1	..
2 Agronomist and Professror of Agriculture	1	..
3 Systematic Botanist and Professor of Botany	1	..
4 Lecturer in Agriculture	1	..
5 Superintendent, Central Farm	1	..
6 Agricultural Meterologist	1	..
7 Assistant Lecturing and Systematic Botanist	1	..
8 Cytogeneticist	1	..
9 Plant Physiologist	1	..
10 Lecturer in Entomology and Gazetted Assistant Lecturer in Entomology.	2	..
11 Lecturer in Mycology	..	..
12 Lecturer in Chemistry and Gazetted Assistant Lecturer in Chemistry.	1	..
13 Lecturer in Agricultural Economics	2	..
14 Lecturer in Civil Engineering	1	..
15 Lecturer in Mechanical Engineering	1	..
16 Lecturer in Animal Husbandry	1	..
Agricultural Research Institute—		
1 Government Agricultural Chemist	1	..
2 Government Entomologist	1	..
3 Government Mycologist	1	..
4 Paddy Specialist	1	..
5 Millets and Pulses Specialist	1	..
6 Oil-seeds Specialist	1	..
7 Cotton Specialist	1	..
8 Horticulturist and Professor of Horticulture	1	..
9 Agricultural Bacteriologist	1	..
10 Assistant Agricultural Chemist	1	..
11 Assistant Entomologist (Apiculture)	1	..
12 Assistant Entomologist, Sugarcane Borer Scheme	..	1
13 Assistant Millets Specialist (Hybrid Cumbu Scheme), Coimbatore	..	1
14 Assistant Oil-seeds Specialist, Coimbatore	..	1
15 Assistant Cotton Specialist, Coimbatore	..	1
16 Assistant Fruit Specialist	1	1
17 Assistant Agricultural Engineer (Research)	..	..
18 Assistant Agricultural Engineer (Groundnut Machinery Scheme)	1	..
	..	1

Strength of Staff of Agricultural Department as on 30th June 1954 (Gazetted)—cont.

OTHER ESTABLISHMENTS—*cont.*

Serial number and name of post. (1)	Permanent. (2)	Temporary. (3)
Agricultural Research Stations, Experimental Farms, Special Schemes, etc.—		
1 Cotton Extension Officer	..	1
2 Assistant Cotton Extension Officers, Coimbatore and Madurai	..	2
3 Assistant Agricultural Engineer (Soil Conservation) Ootacamund	..	1
4 Assistant Agricultural Engineer, Tractor Workshop, Coimbatore	..	1
5 Cotton Certification Officer, Rajapalayam and Gazetted Assistant	..	2
6 Curator, Government Botanical Gardens, Ootacamund	1	..
7 Assistant Mycologist, Ergot Scheme, Ootacamund	1	..
8 Banana Research Officer, Aduthurai	..	1
9 Pepper Specialist, Taliparamba	..	1
10 Assistant Cotton Specialist, Karunganni Scheme, Kovilpatti	..	1
11 Assistant Cotton Specialist (K 2 and Co 4 Scheme), Kovilpatti	..	1
12 Assistant Cotton Specialist, Srivilliputtur	..	1
13 Assistant Cotton Specialist, Tiruppur	..	1
14 Assistant Cotton Specialist, Winter Cambodia Scheme, Coimbatore	..	1
15 Superintendents, Agricultural Research Stations (Nileshwar, Nanjanad, Palur, Aduthurai, Kovilpatti, Tindivanam and Tirurkuppam).	7	..
16 Superintendent, Agricultural Research Station, Mangalore	..	1
17 Agronomist, Agricultural Research Station, Satyamanagalam	..	1
18 Superintendent, Wynaad Colonization Scheme, Ambalavayal	..	1
19 Assistant Fruit Specialist, Coonoor	1	..
20 Assistant Fruit Specialist (Cashewnut Research Scheme), Mangalore.	..	1
21 Superintendents, Sugarcane Liaison Farms, Kulittalai and Nellikuppam	..	2
22 Assistant Agricultural Chemist (Scheme for Agronomic and manurial trials), Tanjore.	..	1
23 Assistant Paddy Specialist, Pattambi	1	..
24 Assistant Agricultural Engineer, River Pumping Scheme, Madras	..	1

Strength of Staff of Agricultural Department as on 1st July 1954.

Abstract of permanent temporary posts as on 1st July 1954,

(UPPER SUBORDINATE).

Serial number and name of post. (1)	Permanent. (2)	Temporary. (3)	Total. (4)
1 Personal Assistant	13	1	14
2 Agricultural Demonstrators	117	..	117
3 Agricultural Demonstrators (Vegetables)	3	..	3
4 Additional Agricultural Demonstrators	..	51	51
5 Special Agricultural Demonstrator (Sugarcane)	..	17	17
6 Special Agricultural Deminstrator (Cotton)	..	13	13
7 Special Agricultural Demonstrator (For Training Demonstration Maistries and Todas).	..	3	3
8 Special Agricultural Demonstrator (Manures)	..	34	34
9 Marketing Assistants	4	..	4
10 Journal Assistant	1	2	3
11 Farm Manager	7	15	22
12 Seed Development Assistant	..	20	20
13 Plant Protection Assistant	6	26	32
14 Teaching Assistant in Agricultural Economics	8	..	8
15 Teaching Assistant in Jails	1	..	1
16 Technical Assistant	1	..	1
17 Farm Manager, Hosur Cattle Farm	1	..	1
Total ..	162	182	344

RESEARCH SECTION.

Paddy Section	30	9	39
Millet and Pulses Section	15	6	21
Cotton Section	10	19	29
Oil-seed Section	11	8	19
Fruit Section	7	6	13
Assistant in Horticultural Training	..	13	13

Strength of Staff of Agricultural Department as on 1st July 1954—cont.

Abstract of permanent and temporary post as on 1st July 1954—*cont.*

RESEARCH SECTION—*cont.*

Serial number and name of post.	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
7 Botany Section	7		7
8 Potato Section	3		3
9 Curator Section	3		3
10 Chemistry Section	18	16	34
11 Mycology Section	9	3	12
12 Entomology Section	14	2	16
13 Sugarcane Section			
14 Pepper Section	2		2
15 Cytogenetic Section		4	4
16 Meterology Section	1		1
17 Plant Physiology Section	1		1
18 Librarian	1	2	3
19 Physical Director	1	1	2
Total	133	89	222

Strength of non Gazetted staff as on 1st July 1954.

Category and name of post.	Permanent.	Temporary.	Total
(1)	(2)	(3)	(4)
Madras Ministerial Service—			
Manager	1		1
Senior Superintendents	4	2	6
Junior Superintendents	9	11	20
Stores Superintendents		2	2
Head Clerk		1	1
Upper Division Clerks and Accountants	35	130	165
Lower Division Clerks, (including Store Clerks)	159	439	598
Store-keeper, III Grade		14	14
Store-keeper, II grade	5	6	11
Typists and Stenotypists	38	59	97
Madras Agricultural Subordinate Service—			
Fieldmen	123	475	598
Madras General Subordinate Service—			
Demonstration Mastries			
Artists	272	659	931
Sanitary Inspector	9	1	10
Assistant Librarian	1		1
Attenders	1		1
Ward Attendant	28	21	49
Museum Curator	1		1
Compounder	1		1
Insectory Attendant	1		1
Laboratory Attenders	21		21
Madras Last Grade Service—			
Peons	181	166	347

Engineering staff as on 30th June 1954.

	Permanent.	Temporary.	Total.
(1)	(2)	(3)	(4)
1 Agricultural Engineering Supervisor	14	32	46
2 Tractor Foreman	6	18	24
3 Assistant Tractor Foreman	6	10	16
4 Senior Mechanic	1	17	18
5 Junior Mechanic	1		1
6 Senior Tractor Driver		94	94
7 Junior Tractor Driver		230	230
8 Oil Engine and Pumpset Driver		405	405
9 Lorry Driver		22	22
10 Jeep Driver		24	24
11 Fitters		1	1
12 Loading Inspector		2	2
13 Welders		162	162
14 Tractor Cleaners		24	24
15 Jeep and Lorry Cleaner		2	2
16 Bus Drivers		1	1
17 Millers			

APPENDIX 45.

List of temporary posts in Upper Subordinate Service as on 1st July 1954.

Serial number.	Sanction number.	Name of the scheme.	Post.	Number of post.	G.O. number and date.	From	To.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	18	Wynaad Colonisation Scheme	Farm Manager	5	G.O. No. 976, Agriculture, dated 30th March 1954.	1st April 1954	28th February 1955.
2	21	Cotton Seed Multiplication Scheme	Special Agricultural Demonstrator.	5	G.O. No. 1088, Agriculture, dated 6th April 1954.	1st July 1953	30th June 1958.
3	44	Scheme for evoultion of Long Staple Cotton.	Cotton Assistants	2	G.O. No. 768, Food and Agriculture, dated 21st May 1953.	23rd November 1951.	22nd November 1953.
4	69	Paddy Station, Ambasamudram	Paddy Assistants	1	G.O. No. 2566, Agriculture, dated 7th August 1954.	22nd April 1954	28th February 1955.
5	72	Hybrid Cumbu Scheme, Coimbatore.	Millet Assistants	4	G.O. No. 539, Food and Agriculture, dated 28th March 1952.	20th March 1952	19th March 1957.
6	90	Scheme for Multiplication, Distribution and Marketing of K2 and Co. 4 Cotton Seed.	Special Agricultural Demonstrator (Cotton).	8	G.O. No. 1010, Agriculture, dated 1st April 1954.	1st April 1954	31st January 1955.
7	103	Scheme for Establishment of Coconut Nursery in important districts.	Coconut Nursery Assistant	3	Government Memorandum No. 62900-B-11/53-9, Agriculture, dated 30th March 1954.	Beyond 31st March 1954.	
8	114	Scheme for Banana Research at Aduthural.	Fruit Assistant	2	Memorandum No. 61428-B-11/53-9, Agriculture, dated 12th April 1954.	Beoand 31st March 1954.	
9	104	Additional Staff for Plant Protection work in district.	Plant Protection Assistants	22	G.O. No. 72, Agriculture, dated 10th March 1954.	1st April 1954	28th February 1955.
10	115	Scheme for the Development of Sugarcane Industry.	Farm Manager, Special Agriculturerual Demonstrator (Sugarcane).	18	Government Memorandum No. 180522-B.I./53-10, Agriculture, dated 16th June 1954.	Up to 30th September 1954.	
11	122	Scheme for the Production of Improved Strains of Millets.	Millet Assistant	2	G.O. No. 519, Agriculture, dated 23rd February 1954.	Up to 31st March 1949.	
12	125	Scheme for breeding of long staple American Cotton in Central districts.	Cotton Assistant	7	Government Memorandum No. 37673-B. III/53-1, Agriculture, dated 1st April 1954.	Beyond 31st March 1954.	
13	127	Scheme for Scientific aid to Pepper Industry.	Additional Pepper Assistants	3	G.O. No. 1267, Food and Agriculture, dated 12th August 1953.	Up to 31st March 1958.	
14	129	Publication of Departmental Journals in Malayalam and Kannada.	Journal Assistant	2	Continuance for one year beyond. Government Orders awaited.	1st April 1954.	....
15	135	Scheme for improvement of Tirunelvelies and Karunganni Cotton.	Cotton Assistant	3	Government Memorandum No. 7603 B. IV/53-8, Agriculture, dated 27th March 1954.	Permitted to continue beyond 1st April 1954.	
16	141	Scheme for Research on Ginger Cultivation.	Ginger Assistant	1	G.O. No. 847, Food and Agriculture, dated 1st June 1953.	1st February 1953.	31st January 1956.
17	144	Employment of Additional Agricultural Demonstrators.	Additional Agricultural Demonstators.	51	G.O. No. 924, Agriculture, dated 27th March 1954.	Up to 28th February 1955.	

List of temporary posts in Upper Subordinate Service as on 1st July 1954—cont.

Serial number.	Sanction number.	Name of the scheme.	Post.	Number of post.	G.O. number and date.	From	To
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
18	145	Seed Development Scheme	Seed Development Assistants ..	20	Continued beyond 31st March 1954 in anticipation of Government Orders.	....	....
19	152	Paddy Research Station, Mangalore..	Paddy Assistant	1	Continued beyond 15th May 1954 pending receipt of orders.	....	....
20	154	Scheme for Establishment of a Coconut Nursery in Tiruchirappalli district.	Coconut Nursery Assistant ..	1	G.O. No. 334, Food and Agriculture, dated 23rd February 1950.	29th April 1950 ..	28th April 1955.
21	156	Fruit and Fruit Products Development Scheme.	Fruit Assistant	3	G.O No. 811, Food and Agriculture, dated 29th April 1954.	Up to 8th December 1956.	
22	159	Improvement of Todas in Nilgiris district.	Special Agricultural Demonstrator.	1	G.O. No. 1871, Food and Agriculture, dated 7th June 1954.	1st May 1954 ..	30th April 1955.
23	167	Horticultural Training Scheme ..	Horticultral Instructor .. .. Horticultral Trainee	1 12	G.O. No. 1384, Food and Agriculture, dated 27th August 1952.	14th August 1952 ..	13th August 1954.
24	169*	Agricultural Meteorology Scheme ..	Statistical Assistant	1	G.O. No. 720, Food and Agriculture, dated 12th March 1954.	1st April 1954 ..	28th February 1955
25	177	Scheme for the improvement of Sweet potato and Tapioca.	Paddy Assistants	2	G.O. No. 177, Food and Agriculture, dated 16th May 1953.	1st October 1953.	30th September 1956.
26	176*	Scheme for breeding unirrigated Combodia Cotton.	Cotton Assistant	1	G.O. No. 169, Food and Agriculture, dated 2nd September 1950.	26th October 1950.	25th October 1955.
27	188	Bifurcation of Malabar district ..	Personal Assistant .. .. Plant Protection Assistant ..	1 2	Government orders awaited for continuing the Scheme beyond 1st April 1954.	..	....
28	193	Opening of an Agricultural Research Station at Satyamangalam.	Chemistry Assistant .. .. Farm Manager	1 1	G.O. No. 1457, Food and Agriculture, dated 21st September 1953.	7th August 1953 ..	6th August 1955.
29	195	Scheme for running six zonal nucleus seed farms of improved oil seed strains.	Oilseed Assistant	4	G.O. No. 1082, Food and Agriculture, dated 25th May 1951.	Up to 1st January 1957.	
30	197	Scheme for Studies on laterite Soils in Madras State.	Chemistry Assistant	1	G.O. No. 1097, Food and Agriculture, dated 25th May 1951.	20th June 1953 ..	19th July 1954.
31	199	Cotton Certification Scheme ..	Certification Inspector	6	G.O. No. 284, Industries Labour and Co-operation, dated 9th February, 1954.	1st April 1954 ..	31st March 1955.
32	200	Scheme for Manurial Varietal and Agronomic trials to determine optimum yield.	Field Assistant .. .. .. Statistical Assistant .. .. Analytical Assistant .. .. Chemistry Assistant	5 1 2 7	G.O. No. 1587, Food and Agriculture, dated 7th August 1951.	19th September 1951.	30th September 1955.
33	202	Scheme for conducting Research on Cashewnut in Madras.	Assistant in Cashew	1	G.O. No. 1579, Food and Agriculture, dated 7th August 1951.	1st August 1952 ..	31st July 1956.
34	205	Opening of an Agricultural Research Station at Paramakudi.	Farm Manager	1	G.O. No. 2564, Agriculture, dated 7th August 1954.	Up to 28th February 1955.	
35	208	Scheme for the investigation of stem breaking disease of arecanut, Palur.	Mycology Assistant	3	G.O. No. 1800, Food and Agriculture, dated 10th September 1951.	....	31st July 1952.
36	209	Scheme for starting of Regional Bee-Research at Paramakudi.	Entomology Assistant	1	G.O. Ms. No. 1602, Agriculture, dated 18th May 1954.	1st April 1954 ..	31st [illegible]