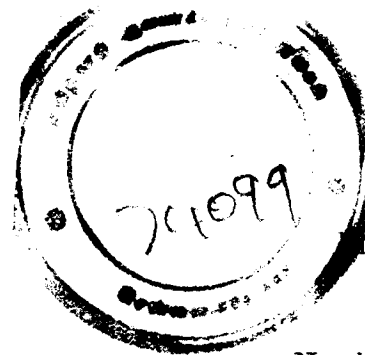


74099

Report on the operations of the  
Department of Agriculture  
for the year-1924-25.

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Department of Agriculture for the  
Year 1924-25.

74099



25  
OFFICE OF THE  
DIRECTOR OF AGRICULTURE, MADRAS,  
*Dated 31st July 1925.*

No. D. 45 Pdl./25.

From

G. R. HILSON, Esq., B.Sc.,  
OFFG. DIRECTOR OF AGRICULTURE,  
*Madras,*

To

THE SECRETARY TO GOVERNMENT,  
DEVELOPMENT DEPARTMENT,  
*Fort St. George, Madras.*

SIR,

I have the honour to submit the report on the operations of the Department of Agriculture for the year 1924-25.

I.—ADMINISTRATION.

A.—STAFF.

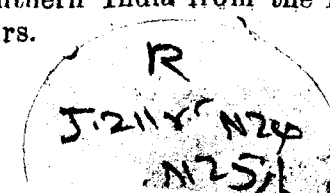
2. Mr. R. D. Anstead was in charge of the Department throughout the year.

*Indian Agricultural Service.*

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3. *Confirmation.*—Messrs. D. Ananda Rao, R. W. Littlewood, D. Balakrishnamurti, Rao Sahib T. S. Venkataraman, S. Sundararaman and G. N. Rangaswami Ayyangar were confirmed.

4. *Deputation.*—Messrs. R. C. Wood, W. McRae and R. Thomas continued to be on deputation throughout the year. The services of Mr. D. G. Munro, Deputy Director of Agriculture, Planting Districts, were lent to the United Planters' Association of Southern India from the 1st April 1924 for a period of five years.



*Madras Agricultural Service.*

5. *Recruitment.*—M.R.Ry. C. Ramaswami Nayudu Garu was appointed as Assistant Director of Agriculture in the arrangements caused by the creation of a new Provincial Assistant to the Deputy Director of Agriculture, Live Stock.

6. *Promotion.*—M.R.Ry. T. Lakshmana Rao Garu, Senior Assistant in the Chemistry Section, who returned to duty after completing a course of training in England was promoted to act as Assistant Agricultural Chemist. Mr. H. E. R. Dunhill was confirmed in his post of Assistant Agricultural Engineer with effect from 18th April 1924.

*Non-gazetted Executive Staff.*

7. Eighteen posts were added to the upper subordinate cadre of the Agricultural Section and the appointment of five more demonstration maistries was sanctioned during the year.

**B.—BUILDINGS, ETC.**

8. The construction of the quarters sanctioned in 1921–22, four imperials, five provincials and one for the Government Agricultural Engineer, was deferred. It has been found impossible to design a type of provincial quarters the cost of which shall fall within the permissible limit and which at the same time shall be acceptable to the officers for whom they are intended. One imperial quarter which was under construction was completed and added to the estate residences during the year.

9. The following is the list of works undertaken departmentally and completed during the year:—

(i) A road leading from the Anakapalle farm to the Agricultural Middle School.

(ii) A workshop at Hagari.

(iii) A ginnery, a cattle shed, and a threshing floor at Nandyal.

(iv) A drying and threshing floor, and an engine shed at Pālūr.

(v) A cattle shed and two manure sheds in the coconut stations and a latrine to the rest house at Nileshtar.

(vi) Quarters for the non-technical teacher, a new shed, a boundary wall, a latrine and a bath room at the Agricultural Middle School, Taliparamba.

(vii) A pig-sty, a store shed and a combined cart stand and implement shed at the Potato Farm, Nanjanad.

(viii) Wire fencing, a masonry drain, a sanitary drain, side walls for wells, latrines for coolies, a threshing floor, a cement floored implement museum, masonry tubs and other minor works at the Central Farm, Coimbatore.

(ix) A rest house, extensions to the cattle shed, a threshing floor, concrete pavement round the floor, revetment of the well and a road culvert at the Paddy Breeding Station, Aduturai.

(x) An office, a grain store, an implement shed, a covered masonry manure pit, 2 cement threshing floors and a seedling stand at the Millet Breeding Station.

(xi) A piggery, a poultry house, fencing the paddock and partitioning off of the seven new feeding stalls and a stone floor at the College dairy.

10. At the Chintaladevi cattle farm, two blocks of work cattle sheds were handed over by the Public Works Department in June 1924. By the end of July all the cattle sheds were provided with cement feeding troughs.

The construction of water troughs was nearly completed but they have not yet been handed over. All the principal roads in the buildings area were laid by the Public Works Department but have not been handed over. The buildings at the farm are almost complete now and it is hoped that all the work will be completed by the Public Works Department within another six months.

11. The Assistant Agricultural Engineer carried out several works on the College Estate, the aggregate cost of which amounted to Rs. 16,800. He executed 24 other works costing Rs. 3,679 as a Public Works disburser. The most important were the construction of roads, well revetment, culverts, drains, new tennis courts and annual repairs and improvement of the College buildings.

**II.—AGRICULTURAL EDUCATION.**

12. *Agricultural College, Coimbatore.*—Two courses of study were conducted during the year; the Certificate course leading to a certificate of proficiency in agriculture, and the Degree course leading to a B.Sc. Ag. The latter is a three-year course. In addition to the usual lectures given by the teaching staff, special lectures were delivered by the

Agricultural Chemist, the Assistant Agricultural Chemist, the Millet Specialist, the Statistical Assistant to the Director of Agriculture, and the Principal of the Forest College. As usual the short course students and the first year B.Sc. students were taken on tour.

13. *Certificate course*.—As it has been decided to abandon this course, no new students were admitted this year. The nine students admitted last year received their second year's course of instruction, sat the examination and all passed. With the passing out of these students this course comes to an end.

The syllabus of the new intermediate course referred to in last year's report is still under consideration by the University.

14. *Degree course*.—As in last year, the selection of students for the new class was made by the committee consisting of the Honourable Minister for Development, the Director of Agriculture and the Principal. The number of applicants for admission to this course was only 49 as against 68 last year. Thirty-seven of these were interviewed and 23 were selected, of whom only 17 joined the College. Three more students were selected from the waiting list, bringing the class up to the required strength of 20. One student in receipt of a scholarship fell ill and left the College and one student resigned, leaving 18 to complete the session. The number of students including one special student taking this course during the year was—

|             |     |    |
|-------------|-----|----|
| First year  | ... | 18 |
| Second year | ... | 8  |
| Third year  | ... | 13 |

A stipend of Rs. 25 per month was continued to each of the 10 students who had received this help in the previous year. Scholarships were awarded as follows:—One to the best student of the first year; two reserved for students from the depressed classes, to two Tiyya students, one of whom resigned on account of ill-health; two reserved for poor and deserving students from the agricultural classes, to students from Guntūr and Malabar; the scholarship reserved for a Muhammadan student was divided between two third-year students as no Muhammadan applied for admission to the course. In addition to these, the Pentland scholarship, reserved for a Malabar student, was awarded.

At the examination held in 1925, 8 students appeared for Part I of whom 6 passed and 12 students appeared for Part II of whom 11 passed. One special student completed the course and sat the examinations.

15. *College Day*.—College Day and the usual Agricultural Conference was held in July 1924 under very unfavourable climatic conditions. Mr. F. Noyce, C.S.I., C.B.E., I.C.S., Secretary to Government, Development Department, presided over the Conference.

16. *Agricultural middle schools*.—There are two agricultural middle schools, one at Taliparamba and one at Anakāpalle. The primary purpose of these schools is to provide, for the sons of cultivators, a vernacular course of instruction in the principles of agriculture, with special reference to the conditions of the particular tract in which each school is situated. It is intended that the boys who are selected for admission to these schools shall be of a certain age, shall have reached a certain standard of ordinary education, and shall, when they have completed the course, return to cultivate the land. The ultimate object aimed at is to raise up a class of cultivators who shall be better cultivators than their fathers, more alive to the possibilities of their traditional occupation and more receptive of new ideas.

The results which have been obtained up to date and the expenditure incurred up to the end of the official year under report are shown in the following tables:—

| Year.               | Number of boys selected. | Number of boys who joined the first-year class. | Number who are sons of cultivators. | Number who remained to end of first year. | Number who passed out at end of second year. | Number who returned to the land. |
|---------------------|--------------------------|-------------------------------------------------|-------------------------------------|-------------------------------------------|----------------------------------------------|----------------------------------|
| <i>Taliparamba.</i> |                          |                                                 |                                     |                                           |                                              |                                  |
| 1922-23             | 20                       | 20                                              | 20                                  | 15                                        | ...                                          | ...                              |
| 1923-24             | 20                       | 16                                              | 16                                  | 13                                        | 14                                           | 5                                |
| 1924-25             | 33                       | 27                                              | 21                                  | 21                                        | 13                                           | 1                                |
| 1925-26             | 24                       | 14                                              | 13                                  | ...                                       | ...                                          | ...                              |
| <i>Anakāpalle.</i>  |                          |                                                 |                                     |                                           |                                              |                                  |
| 1922-23             | 17                       | 13                                              | 10                                  | 5                                         | ...                                          | ...                              |
| 1923-24             | 14                       | 7                                               | 2                                   | 6                                         | 5                                            | 3                                |
| 1924-25             | 34                       | 29                                              | 25                                  | 15                                        | 6                                            | 1                                |
| 1925-26             | 31                       | 11                                              | 6                                   | ...                                       | ...                                          | ...                              |

| Year.               | Expenditure.   |            |        | Receipts. |               |        |
|---------------------|----------------|------------|--------|-----------|---------------|--------|
|                     | Non-recurring. | Recurring. | Total. | Fees.     | Farm produce. | Total. |
| <i>Taliparamba.</i> |                |            |        |           |               |        |
|                     | RS.            | RS.        | RS.    | RS.       | RS.           | RS.    |
| 1922-23 ...         | 25,477         | 5,751      | 31,228 | 750       | 451           | 1,201  |
| 1923-24 ...         | 1,856          | 8,578      | 10,434 | 1,385     | 1,100         | 2,485  |
| 1924-25 ...         | 3,795          | 11,522     | 15,317 | 1,087     | 1,080         | 2,167  |
| Total ...           | 31,128         | 25,851     | 56,979 | 3,172     | 2,631         | 5,803  |
| <i>Anakāpalle.</i>  |                |            |        |           |               |        |
| 1922-23 ...         | 10,149         | 3,263      | 13,412 | 345       | ...           | 345    |
| 1923-24 ...         | 13,155         | 4,513      | 17,668 | 525       | ...           | 525    |
| 1924-25 ...         | 1,296          | 7,272      | 8,568  | 510       | 999           | 1,509  |
| Total ...           | 24,600         | 15,048     | 39,648 | 1,380     | 999           | 2,379  |
| Grand total ..      | 55,728         | 40,899     | 96,627 | 4,552     | 3,630         | 8,192  |

The figures for recurring expenditure at Anakāpalle are low, because the numbers of students attending the school are low and because there is only a very small area of land attached to the school. The practical training given to the students at this school has been carried out at the expense of the legitimate work of the station, viz., research for which purpose it was started. The figures for expenditure do not include in either case the value of the time and travelling allowance spent by the Deputy Directors, the Assistant Directors, the school staff and the district demonstrators in beating up recruits for the schools.

17. Of the 38 pupils who have passed out of the two schools, 10 are known to have returned to the land; in one case this merely means that he is engaged in laying out a mango tope, 21 are known to be idle, of whom 13 definitely hope to get employment under Government, 2 are attending a secondary school, and one was employed as a head coolie by the Deputy Director, VII Circle. Information regarding the remaining 4 is not available.

18. *Rural education.*—The classes for juvenile and adult labourers at the Agricultural Stations at Coimbatore, Pālūr and Anakāpalle continued to work during the year with satisfactory results. A special report on the working of these classes has already been submitted to Government.

### III.—SEASON AND RAINFALL.

19. The south-west monsoon commenced early on the West Coast and gave heavy and almost continuous rainfall till the end of August. The rainfall was also heavy in portions of Coimbatore, Madura, and Tinnevely adjoining the Ghats. In most of the other districts, especially in North Arcot and Salem, the monsoon was at first weak but copious and well-distributed rainfall was received in the third week of August and in September.

20. The rainfall in the Western Ghats in July produced unprecedented floods in the rivers of the West Coast, the Cauvery and its tributaries, the Bhavāni and the Noyal, and the Coleroon. These floods seriously damaged communications, washed away houses, crops, and fodder stacks, and silted up some thousands of acres of cultivated land in the affected portions of Malabar, Trichinopoly, and Tanjore. There was little water in the channels in Tanjore in the main crop season owing to the silting up at the Grand Anicut and the numerous breaches. In the rest of the Presidency, the season was better than in the previous year and the famine relief works started in Ganjām, Bellary and Anantapur as a result of the unfavourable season in the previous year were closed down before the end of October.

21. The north-east monsoon was late on the Madras coast and burst only in the last week of October. The rainfall in November was satisfactory in most districts and heavy in the Circars; Ganjām experienced cyclonic weather similar to that experienced at the same time last year. There was little or no rainfall in December. This monsoon was favourable in the Circars but inadequate in the other districts, especially in Bellary, Anantapur, Trichinopoly, Tanjore and the West Coast.

22. On the whole, the year was not favourable, except in the Circars and the extreme south of the Presidency. In the Circars, the paddy crop was one of the best in recent years. On the other hand the yield of paddy in Tanjore and in parts of the Central districts and of cotton in the Deccan and Central districts was lower than the average.

23. The effect of the season was reflected in the crops on the agricultural stations and in the work of demonstrating agricultural improvements in the districts. The season was favourable at Anakāpalle and Samalkota. Sugarcane at Samalkota did not do as well as in the previous year, as the

frequent rains resulted in abnormal arrowing. At the Guntūr farm, the yield of cotton was good; other crops also yielded fairly well, but chillies suffered from excessive wet and insect attack. *Mungari* (early) crops failed at Nandyal but yielded well at Hagari. *Hingari* (late) crops proved a failure at both stations owing to the drought after November. Crops were fair at Pālūr and Koilpatti but cotton at Koilpatti was somewhat affected by the rains in March. At Taliparamba the yield of all crops was poor. At Coimbatore conditions were ideal for paddy but the season was unfavourable for other crops as in the previous year. The heavy rains proved again unfavourable to coconuts on the West Coast stations and to potatoes at Nanjanad.

24. In the I, II and VI Circles, the season aided progress in the demonstration of agricultural improvements. In the Vizagapatam district, there had been a series of bad seasons, and the advantages afforded by the better season were consequently utilized to the fullest extent. In the III Circle, the district work started favourably but ended in disappointment, though not to the same extent as in last year. In the IV Circle, the season did not permit the sowing of green-manure crops on a large scale but the year was more favourable than the previous year and fair progress was made. In the V Circle, most of the demonstration plots in the taluks of Shiyali, Lalgudi, and Trichinopoly were either scoured by the July floods or silted up. Progress in the demonstration of agricultural improvements was hampered in the V and VII Circles by the unsatisfactory condition of the ryot as a result of the floods.

#### IV.—RESEARCH.

##### A.—CROPS.

##### (a) Paddy.

25. *Plant breeding*.—M.R.Ry. K. Ramayya Avargal was in charge of the Economic Botanist's Section during the year. As in previous years, the work done by this section followed two main lines:—(1) the isolation and test of strains of paddy, followed by the multiplication of seed of those strains

found to be an improvement upon the strains or unimproved varieties already under cultivation, with the object of providing material for distribution to the cultivator; (2) the study of the inheritance of characters with the main object of effecting a greater improvement in the crop than is possible by following the ordinary selection methods outlined in (1).

26. *Coimbatore Station*.—The season was, on the whole, favourable though the yields obtained were hardly so good as was the case last year.

*Strains under cultivation*.—Of the strains produced at this station and already under cultivation G.E.B. No. 24, Coimbatore Nos. 1 and 2 continue to make headway. Coimbatore No. 3 a more recent production, reported last year as having given on a five year test an average increase of 9 per cent over the local mixture did well this year on the Central Farm.

*New strains*.—Six strains of Anaikomban gave an increase of 10 per cent or more and one strain of Chinnasamba an increase of 15 per cent over the respective standards in this year's trials. Of the 45 selections from the cross Local x 24, made in the endeavour to produce a blast resistant strain, none gave so good a yield as the standard, Coimbatore No. 3, though several matured a fortnight earlier than that strain. Work on the cross Java x 24 made six years ago is now beginning to bear fruit; 45 strains have been selected this year for comparative test.

*Inheritance*.—Work on the problem of failure to set grain was begun this year. The results obtained from the cross Sirumani x Anaikomban appear to indicate that there is partial linkage between failure to set grain and the colour of the glume. A detailed study of the problem of "lodging" was also begun.

*Seed distribution*.—20,700 lb. of seed were distributed during the year partly direct to cultivators and partly to Circle officers.

27. *Aduturai Station*.—The season at this Station was unfavourable. Partial failure of the water-supply in July caused difficulty in transplanting the early crop and total failure of supply after August left the main crop dependent on the poor north-east monsoon rains supplemented by water lifted from a tank close to the farm.

*Strains under cultivation*.—The following list shows the strains produced at this station which are being distributed,

with their advantage over the local mixtures they are intended to replace:—

| Old No.      | Station name.   | Variety.             | Percentage increase of yield over local seed. |
|--------------|-----------------|----------------------|-----------------------------------------------|
| R.S. 76 ...  | Aduturai No. 1. | Red Sirumani ...     | 16                                            |
| W.S. 174 ... | Do. 2.          | White Sirumani ...   | 10                                            |
| K. 18 ...    | Do. 3.          | Early Kuruvai ...    | Nil, but shorter in duration.                 |
| K. 74 ...    | Do. 4.          | Ordinary Kuruvai ... | 12                                            |
| N.S. 4 ...   | Do. 5.          | Nellore Samba ...    | 25                                            |
| R.O. 45 ...  | Do. 6.          | Red Ottadan ...      | 13                                            |
| W.O. 21 ...  | Do. 7.          | White Ottadan ...    | 13                                            |

The two last strains were given out for the first time last year, the others are now well known in the delta.

*New strains.*—Seventy-three selections from the crosses between White Sirumani and five other varieties were brought under comparative test this year with Aduturai No. 2 as the standard of comparison. Some of these gave an increase of 10 per cent over the standard and some while yielding only as well as the standard proved to be of shorter duration.

Over 200 single plants have been selected from among the short duration varieties, Red Kuruvai, White Kuruvai, Kar, Chitrakali and Sornawari. A number of single plants free from disease, from among the crops affected by "Blast" have been selected.

*Seed distribution.*—76,800 lb. of seed were distributed during the year.

#### *Work in Charge of Deputy Directors.*

28. *First Circle, Anakapalle Station.*—The season was, on the whole, favourable. An average acre-yield of 2,658 lb. of grain was obtained against an average of 2,074 for the last four years.

*Strains.*—A number of single plant selections were sown in small plots, but owing to the Farm Manager having to undertake the management of the Agricultural Middle School and to the fact that the farm staff was depleted in the interest of district work no examination of the progeny was possible.

*Varieties.*—Twelve varieties collected from the district were grown. Some of these appear promising and will be studied further.

29. *Samalkota Station.*—The season was favourable.

*Main crop.*—The average yield per acre was 3,069 lb. of grain which was rather better than the yield obtained last year.

*Strains.*—The following strains were compared respectively with the local mixture of the same varietal name.

Punasa akullu Nos. 2 and 3, Ratnachudi Nos. 7, 8 and 9, Palagummasari No. 7, Rasangi Nos. 21 and 23 and Garikasannawari Nos. 4 and 7. In each case the selected strain gave a higher yield than the local mixture but in no case was the increase greater than the probable error of the experiment.

*Intermediate crop.*—The search for a good yielding variety of paddy which can be planted between September and November and which will come to harvest before the canals are closed was continued. Five varieties, Molakalukulu, Korangu Samba, Masipushanam, Iswarakora and Ramagarudan Samba, were planted in large plots in September and each gave a yield of over 2,500 lb. of grain per acre.

*Late crop.*—Five varieties, Garikasannawari, Punasa atragada, Dalwa, Bobbiliganti, Bobbilbudama were compared with one another. As in previous years, the first two gave the best results.

30. *Fourth Circle.*—The season was fair for paddy grown under ordinary wet land conditions and bad for others.

*Semi-dry paddy.*—None of the ten varieties tried this year succeeded in producing a crop.

*Paddy under well-irrigation.*—The number of varieties tested this year was reduced from 19 to 13. The yields were poorer than was the case last year. No conclusion is yet possible as to which variety is the most profitable to cultivate under these conditions as the experiment has been carried on for only three years.

*Paddy under channel irrigation.*—The yields obtained were considerably better than last year.

(a) *Short duration kar varieties.*—Three varieties Chitrakali, Sornawari, and Vellai Manakattai were tested for the fourth year in succession and K. 18 from Aduturai, for the first time. Of the first three, the first and last named have given the best results on the average of the four years. K. 18 gave a poor yield by comparison.

(b) *Main samba varieties.*—Ten varieties were tested this year. Four of these gave very heavy acre-yields, but as the varieties were all grown on small plots the acre figures

are much higher than would be obtained under more normal conditions.

(c) *Second crop varieties*.—These were planted late, but gave better yields last year. Of the four varieties which have been tested for three years in succession Poombalai has given a slightly higher average than the others.

#### *Manuring.*

31. *First Circle, Samalkota Station*.—The results obtained from experiments this year indicate that bone-meal used in conjunction with green leaf is a profitable form of manuring for the poorer land in the deltaic area.

32. *Third Circle, Nandyal Station*.—The results to date of the experiments carried out on the Station appear to indicate that the local cultivator is wasting his cattle manure by applying it to paddy land and that a mixture of groundnut-cake and bone-meal is an adequate substitute for the local manuring of green leaf plus cattle manure.

33. *Fourth Circle, Palur Station*.—A tentative experiment tried this year comparing castor-cake with ganja cake as a manure for paddy gave a result in favour of the former. The difference, however, was not greater than the experimental error involved.

34. *Central Station*.—The experiments to test whether the application of (a) green manure to paddy land was physical or manurial and (b) Trichinopoly phosphate or tetraphosphate in conjunction with green manure gave a better yield than the last named manure used alone, were continued.

An experiment to test the effect of Nitrate of Soda and Sulphate of Ammonia used in conjunction with green manure, with and without the addition of phosphate was started this year. The experiment started last year to test the effect of cyanamide alone and with superphosphates was continued.

#### *Cultural Experiments.*

35. *First Circle, Samalkota Station*.—The experiment to test the difference between a crop transplanted with seedlings from a thick sown bed and one from a thin sown bed was continued. The results for three years are in favour of thin sowing.

36. *Third Circle, Nandyal*.—An experiment carried out at this station to compare bunch planting with single

planting of seedling has each year for three years given results slightly in favour of the latter.

#### (b) *Cotton.*

37. *Plant breeding*.—Mr. R. C. Broadfoot remained in charge of the Cotton Specialist's section throughout the year.

As in the case of paddy the work of this section follows the two main lines referred to in the paragraph dealing with that crop. In the case of cotton, however, except in the case of a few minor characters chiefly useful as marks of identification and so far as is known of no economic importance, the study of the inheritance of characters is much more difficult than is the case with paddy. The reason for this is twofold. First, the characters which are of importance, e.g., length of lint appear to be compound and not simple and their study involves the examination of a very large number of individuals, and secondly owing to the fact that the produce of the cotton plant does not mature all at one time and has to be picked from the plant as it ripens the number of plants which can be dealt with by one assistant aided by a plant collector is small not more than 1,000. If, therefore, this line of work is to be carried out as it should be a very much larger staff is needed than is employed at present.

38. *Coimbatore Station*.—The season was abnormal. A heavy fall of 16 inches of rain fell in July and, among other items of damage, caused the well to collapse. The cultivable area is now in good order. The soil has improved in tilth and in freedom from perennial weeds which were abundant when the land was acquired.

*Strains under cultivation*.—As yet no strain has been definitely given out for cultivation from this station. Cambodia No. 295 has been tried for two years on a field scale near Avanashi by the Deputy Director of Agriculture, VIII Circle, and on the Central Farm. The reports received on its behaviour are favourable. It will be renamed Co. No. 1 and issued for cultivation in the Avanashi tract.

*Strains under test*.—Comparative trials of the Cambodia strains Nos. 295, 440 and 664 were made, using an impure strain No. 15 now under cultivation in the district as the standard of comparison. The final figures are not yet to hand, but the results up to the time of writing show that No. 440 has given the best yield, apparently mainly because it has been able to survive the attack of the *Stem Weevil*.

*Inheritance—Indicum x Roseum.*—From the produce of the seven plants referred to in last year's report ten selections were made and were grown in the season under report. Stem weevil attack was worse than in previous years and the majority of the more promising plants succumbed before maturity.

*Cernuum x Indicum.*—From the produce of the F 2 generation grown last season six plants were selected. The seed of these was sown this season. Germination and growth were better than was the case with the Indicum Roseum cross, but here again insect pests took their toll.

*Sea Island x Cambodia.*—From the F 2 generation grown last year, 12 selections were made and sown this year. This generation was perhaps not quite such a medley of types as the previous one. We have, however, still a long way to go before we arrive at the hoped-for destination a type of plant with the quality of lint between Cambodia and Sea Island and all other qualities like Cambodia. Here again the plots were decimated by insect attack.

*Herbaceum selection work.*—The process of resolving the local mixture of herbaceum cotton into its component strains was continued. The results obtained so far are distinctly promising. Here also work was hampered by the stem weevil. In some plots practically all the plants succumbed while no plot escaped. It is obvious that work on this station has been and is being hampered by the ravages of insect pests, particularly the stem weevil. The attack of this pest this year was the heaviest on record. There is little doubt that it is gradually becoming more formidable both in intensity of attack and in area affected. Unless, therefore, the method of dealing with this pest is made more drastic than is the case at present, it is certain to become a more and more effective brake on our efforts to improve the quality of lint and the yield per acre of the cotton crop of this Presidency.

*Work in Charge of the Deputy Directors of Agriculture.*

39. *Guntūr Station.*—The season was satisfactory and good yields were obtained. Cocanadas gave an average yield of 534 lb. of kapas per acre as against 237 last year.

*New strains.*—From the 500 single plant selections made last year, 13 were sown this year.

40. *Third Circle, Nandyal Station.*—The season was, on the whole, fair. Unfortunately, the spotted boll worm was

more in evidence than usual. The average yield of kapas per acre was 121 lb. as compared with 123 lb. obtained last year.

*New strains.*—Three individuals were selected from the 250 single plants selected last year, and were sown this year. Only one of these appears to be pure in respect of its vegetative characters. Two selections were made from strain No. 54 and sown.

*Strains under test.*—A comparative test of Gadag, Hagari 25, No. 54 and Nandyal 14, was carried out. The last named has given the highest yield of kapas this year and compared with last year has changed places with Gadag.

*Hagari Station.*—The season was, on the whole, satisfactory for mungari, but poor for hingari cottons.

*Mungari cotton.*—Several promising selections have been obtained. They have, however, still to be tested.

*Hingari cotton.*—The test carried out this year with H 62, H 25 and local did not give definite results. Two hundred and fifty new selections, have been made from the local mixture.

41. *Sixth Circle, Koilpatti Station.*—The season was satisfactory, and an average yield of 557 lb. of kapas was obtained. The six strains of cotton under examination last year were reduced to three in number.

*Manuring.*

42. *Third Circle, Nandyal Station.*—The experiments with Ammonium Sulphate and Nitrate of Soda were continued. There was the same lack of response to these manures noted in previous years. Under the conditions prevailing at this station neither of these manures appears to be of any good for cotton, when used alone.

43. *Hagari Station.*—Similar tests with these manures gave precisely similar results.

44. *Sixth Circle, Koilpatti Station.*—At this station, Ammonium Sulphate was tested as a manure for cotton. No effect was noticeable.

(c) *Millet.*

45. *Plant Breeding.*—M.R.Ry. G. N. Rangaswami Ayyangar Avargal remained in charge of the Millet Specialist's section throughout the year. The most important crop dealt

with by this section, and to which most attention is being devoted, is cholam. The next most important is ragi. A certain amount of attention is being devoted to the less important millets, cumbu, tenai, samai, and kudiraivali. The work of this section follows the two main lines already referred to under paddy.

46. *Coimbatore Station—Cholam.*—One hundred and ten single plant selections were grown in small plots. Ninety-seven of these have been retained for further examination.

*Ragi.*—Two hundred and ninety-three single plant selections were made as a preliminary to the study of the crop.

*Other millets.*—Fifty-six single plant selections of cumbu, 46 of samai, 25 of kudiraivali and 24 of tenai were made.

47. *Nandyal Station—Cholam.*—Fifty-four single plant selections of pattsa jonna were grown in small plots, of which twenty have been retained for further examination. One hundred fresh selections were made. A comparative test of eight pattsa jonna strains with Nandyal No. 6 as the standard was carried out. Two of these have given better returns than No. 6.

48. *Hagari Station—Cholam.*—One hundred and ten single plant selections of tella jonna were grown in small plots, of which 57 have been retained for further examination. One hundred fresh selections were made.

*Work in charge of the Deputy Directors of Agriculture.*

49. *Third Circle, Hagari Station—Cholam.*—(1) *Strains.*—A comparative test with seven strains evolved at this station carried out this year gave a result in favour of type No. 1.

(2) *Varieties.*—(a) *Grain.*—Fourteen varieties were tested against type No. 1 none of which did so well as that strain. This result is in accordance with the results of three previous trials.

(b) *Fodder.*—Seven varieties were compared. Of these periamanjai gave a slightly better yield than the others. On the average of 6 tests, Palchalam, Peddajonna, Sivappu-mapillai-miniki and Periamanjai are equally good.

50. *Fourth Circle, Palur Station—Ragi.*—(a) *Unirrigated.*—A comparative test of Poovasi ragi and three different strains from Hebbal was carried out during the year.

(b) *Irrigated.*—A comparative trial of local ragi with Hagari No. 8 and Hebbal No. 41 was made and gave a result in favour of the local variety.

51. *Cultural Experiments—Cholam.*—Spacing experiments carried out at Nandyal and Hagari gave results in favour of 16" and 24" spacing from line to line, respectively.

(d) *Sugarcane.*

52. *Plant breeding—Coimbatore Station.*—M.R.Ry. Rao Sahib T. S. Venkataraman Avargal, remained in-charge of the sugarcane breeding-station throughout the year. This station is maintained chiefly for the improvement of canes in North India, but much of the research work is of value to South India. During the year under report arrowing started well but the setting of seed was prejudicially affected by rainy weather. Over two hundred combinations were attempted, and over two lakhs of seedlings were raised many of which are of more than average vigour.

*Work in charge of the Deputy Directors of Agriculture.*

53. *First Circle—Anakapalle Station—Varieties.*—Fourteen varieties were grown on small plots to obtain seed for carrying out a test for yield. An analysis of the juice from a few canes in each was made. The results show that a few of the varieties in respect of quality of juice are distinctly promising.

Reference was made in last year's report to the experiment tried of raising seedlings here from seed sent from Coimbatore. The experiment was a success. Four thousand seedlings were raised of which 1,000 were planted. Fifteen of these have been kept for further trial.

54. *Samalkota Station.*—Twenty-two varieties were grown on small plots as at Anakapalle, with similar results.

55. *Fourth Circle—Palur Station.*—Twelve varieties were compared this year. J. 247 gave the best yield, with Java Hebbal a very good second. On the average over three years the first named is easily the best.

*Manuring.*

56. *First Circle—Anakapalle Station.*—An experiment to test the effect of an application of 15 cwt. of groundnut cake alone, 10 cwt. of groundnut cake plus 2,000 lb. of wild indigo, and 8 cwt. of groundnut cake plus 4,000 lb. of wild indigo gave a result in favour of the heaviest dose of cake, not only in yield but also in actual money return.

57. *Fourth Circle.*—The experiment to compare the value of castor-cake alone, castor-cake plus ammonium sulphate,

fish-guano alone and groundnut cake alone, each supplying 100 lb. of nitrogen per acre was continued. The results for this year and on the average for the three years during which this experiment has been carried out, give no indication that one manure is better than the other.

(e) *Coconuts.*

58. Research work on coconuts on the lines laid down was continued. Results of this work cannot be expected for some years, and as yet there is nothing to report.

(f) *Fruit Culture.*

59. Mr. F. H. Butcher remained in charge of the fruit gardens throughout the year.

60. *Coonoor Pomological Station.*—The season was, on the whole, satisfactory.

*Apples*—The plantation continues to improve. Some of the varieties bore good crops, “Rome Beauty” and “Irish Peach” doing best in this respect.

*Plums.*—These continue to thrive and many of the varieties produced good crops during the year. “Yellow” and “Hale” were the best, producing 39 lb. and 35 lb. per tree, respectively. Unfortunately, a large portion of the crop was spoilt by fruit fly.

*Pears.*—The trees continue to make growth, but are still several years from bearing.

Of the other fruits, Quinces, Persimmons, Oranges, Strawberries, Tree tomatoes, Strawberry guavas, Passion fruit, all did well. Figs did not do so well as anticipated, and Cape gooseberries ceased to thrive.

*Nurseries.*—The demand for young fruit trees was poor; only 416 grafted plants and 801 seedlings were distributed as against 847 and 964, respectively, last year. There is a large stock of grafted trees on hand.

61. *Burliar Experimental Fruit Gardens.*—The season was satisfactory. The outstanding feature of the year was the record crop of mangosteens obtained, the explanation for which probably lies in the fact that the crop failed last year and that the trees were well manured. A total yield of over 2,800 lb. of fruit was obtained. A large number of seedlings have been raised.

62. *Kallar Experimental Fruit Gardens.*—The season here was not so satisfactory. Considerable damage was done to the gardens by the abnormal rainfall. Oranges and mangoes

both produced good crops but, as in last year, fruit-fly attacked the latter and spoilt the majority of the fruits. Considerable attention was paid this year to the manuring of the fruit trees and plants and to the growing of green-manure crops with the object of gradually getting the soil into good heart.

63. The profit and loss account for the year is shown in the table given below:—

|                          | Pomological Station. |           | Burliar gardens. |           | Kallar gardens. |           |
|--------------------------|----------------------|-----------|------------------|-----------|-----------------|-----------|
|                          | Expenditure.         | Receipts. | Expenditure.     | Receipts. | Expenditure.    | Receipts. |
|                          | RS.                  | RS.       | RS.              | RS.       | RS.             | RS.       |
| Dead stock ...           | 51                   | ...       | 7                | ...       | 10              | ...       |
| Working charges ...      | 1,629                | ...       | 1,268            | ...       | 2,248           | ...       |
| Manures ...              | 65                   | ...       | ...              | ...       | ...             | ...       |
| Sale of fruit plants ... | ...                  | 578       | ...              | 205       | ...             | 198       |
| Sale of fruits ...       | ...                  | 1,396     | ...              | 2,120     | ...             | 809       |
| Total ...                | 1,745                | 1,974     | 1,275            | 2,325     | 2,258           | 1,007     |
|                          | Profit, 229          |           | Profit, 1,050    |           | Loss, 1,251     |           |

| Percentage of expenditure received as receipts. | Pomological Station. | Burliar gardens. | Kallar gardens. |
|-------------------------------------------------|----------------------|------------------|-----------------|
| ...                                             | 113                  | 182              | 45              |

Taking all the three stations together, the receipts obtained just covered the expenditure incurred.

64. *Taliparamba Station.*—A small fruit garden was started last year. Mangosteen and Tree tomatoes have failed to grow, but anonas, laquot, guava, rose apple, citrons and sapota are all growing fairly well.

65. *Plantains—Samalkota Station.*—The previous year's crop was harvested during the year under report and from 78 cents gave a return of Rs. 1,149. A manurial experiment with castor-cake, castor-cake plus kainit and farmyard manure was tried. The results do not show that any one manure is better than another.

(g) *Potatoes.*

66. The Nanjanad station remained in charge of the Deputy Director of Agriculture, VIII Circle, throughout

the year. Work on this station is being carried out along the following lines:—

(a) Devising improvements in the method of cultivation.

(b) Testing manures.

(c) Testing varieties.

The results obtained so far show (1) that much more use can be made of cattle-power than is ordinarily done, which was to be expected and (2) the need for an increased supply of cattle manure which was also to be expected.

This station should have a useful future before it. Work, however, will not have to be limited to potatoes. The system of agriculture followed by the Badagas will have to be studied and improved and work on the improvement and care of pasture and on the care of cattle will have to be undertaken.

(h) *Planters' Crops.*

67. *Rubber*.—Mr. H. T. Ashplant continued in charge of the research work on rubber mycology throughout the year.

The most important work of the year has been the spread of the practice of spraying with bordeaux mixture to check secondary leaf-fall. So successful have been the results that it is expected that this season with very few exceptions on every estate a greater or less proportion of the acreage will be sprayed. There are 76 spraying machines in operation. It is estimated that before the spraying season closes approximately 4,000 acres of rubber from 9 to 20 years old and about 6,000 acres of less mature rubber will have been sprayed.

A manuring experiment to test the value of nitrate of soda for rubber was started. An anti-drip device for reducing the loss of crop during the monsoon was invented.

The investigation of the anatomy of hevea bark and of the budding of hevea was continued. In regard to the latter the Rubber Mycologist is now in a position to give instruction in the most suitable method.

In order to determine whether the destructive distillation of rubber has economic possibilities several tests with scrap rubber were carried out. The results were not favourable, the product obtained being less valuable than the material used.

(i) *Groundnut.*

68. Work on groundnuts is being carried on at Anakapalle and at Palur. At the former station a varietal test

was carried out and at the latter varietal, manurial and cultural experiments were conducted. The results are as yet too indefinite to warrant any pronouncement being made. At Palur selection work is under progress.

(j) *Miscellaneous crops.*

69. Varietal tests with tobacco and chillies were carried out at Guntūr. The former crop did rather better this year than last, but the latter suffered from excessive rain and insect attack. There is nothing of interest to report.

B.—CHEMISTRY.

70. M.R.Ry. B. Viswanath Garu remained in charge of the Agricultural Chemist's section throughout the year.

71. *Routine work*.—1,441 samples were analysed during the year as against 1,051 last year. There is a steady increase in this work from year to year and the full energies of the staff of this section are gradually being monopolised by this work to the detriment of research work.

72. *Soil survey*.—The survey of North Malabar was completed and the results are being tabulated preparatory to their publication in the form of a bulletin.

*Manurial Investigations.*

73. *Calcium cyanamide*.—Field experiments with this manure alone and in conjunction with soluble phosphates were tried. The results show that a very definite increase of yield can be obtained by the use of this manure, but that its price is against its extensive use.

74. *Phosphates*.—Superphosphate used alone was found to have a depressing effect on the yield wherever used. Experiments with Trichinopoly phosphate and Tetra phosphate gave encouraging results.

75. *Farm yard manure*.—The experiments on the method of storing this manure were continued. As has been found previously the box system yields the most satisfactory results.

Experiments to test the influence of various chemicals in inhibiting the loss of nitrogen from farm yard manure showed that no loss occurred if sulphur was mixed with the manure. The quantity used was however high.

76. *Artificial farmyard manure*.—The experiments were continued. It was found that when cattle dung was used to

supply the starter nitrogen there was no loss of nitrogen from the material as in the case with calcium cyanamide.

77. *Availability of different organic manures.*—Tests carried out this year with the following oil-cakes, groundnut, castor, pungam, ganja and with fish-guano and hornmeal indicated that groundnut cake was the most satisfactory.

78. *Manurial requirements of coconuts, plantains and cotton.*—Analyses of the different parts of these plants at different stages of growth were made in order to determine which plant foods these crops made most demand.

Potash and phosphoric acid for coconuts, potash and lime for plantains and nitrogen, lime potash and phosphoric acid for cotton appear to be the plant foods upon which most demand is made.

79. *Tricky phosphatic nodules.*—The field work referred to in last year's report was interfered with by the floods. Pot culture experiments using Cuddapah slab frames sunk in the field itself instead of pots are being carried out by M.R.Ry. Rao Sahib M. R. Ramaswami Sivan Avargal, the Lecturing Chemist.

#### C.—BOTANY.

80. M.R.Ry. C. Tadulingam Avargal, remained in charge of the Lecturing Botanist's section throughout the year.

The routine work of this section is teaching and the collection of a complete set of herbarium specimens of all the plants in the Presidency. In addition to this, the identification of specimens for officials and the general public forms no inconsiderable part of its work.

Part VI of Gamble's *Flora of the Madras Presidency Microcarpæ in Scrophulariaceæ to the end of Plautaginaceæ*, was published during the year. Herbarium material was sent to Kew for the preparation of the next volume.

#### D.—ENTOMOLOGY.

81. M.R.Ry. Rao Sahib Y. Ramachandra Rao Garu continued in charge of the Entomological section throughout the year.

The study of the pink boll-worm *P. Gossypiella* and the spotted boll-worm *E. spp.*, the stem weevil, *P. affinis*, the paddy borer, *S. incetellus*, the cholam fly *C. angustatus* and the fruit moth *O. spp.*, was continued.

Spraying of mango trees against the mango-hopper was continued. As this year the attack of this pest was heavy, the benefit of spraying was very noticeable.

Work on the fruit fly, which is causing such havoc in the Government fruit gardens, was begun.

#### E.—MYCOLOGY.

82. *Red rot disease of sugarcane (Colletotrichum falcatum).*—An experiment devised to test the possibility of controlling this disease by immersing the setts in hot water for a definite interval of time was tried. The results obtained indicate that the method is of no value.

*Blast disease of paddy (Piricularia oryzae).*—A series of experiments were tried at Aduturai and on the Central Farm with the object of devising a method of controlling this disease. The results obtained indicate that the line of attack most likely to lead to success is the evolution of resistant strains.

*Wilt disease (Rhizoctonia spp.).*—(a) *On groundnut.*—A severe outbreak at Pālūr drew attention to this disease. The data obtained point to the possibility of partially controlling this disease by the careful selection of disease-free seed at sowing time.

(b) *On cotton.*—The study of this disease on cotton was continued. As yet there is nothing new to report.

*Vermicularia sp.*—This is a disease which was noticed this year for the first time on herbaceous cottons. The disease attacks the boll which frequently fails to open, and also the contents of the boll. The investigation of this disease has been commenced.

*Short smut of cholam (Cintractia Sorghi Vulgaris).*—Experiments were conducted with Germisan, Tillantin and Upsulur in comparison with copper sulphate as a preventive against this disease. The results show that the main difference between these fungicides is one of cost.

*Leaf shredding disease of cholam (Sclerospora graminicola).*—Further study has not yet given a definite indication of the manner in which this disease is carried over from crop to crop.

*Mosaic disease of cardamoms.*—A series of experiments to test the effect of manures and spraying on this disease were laid down. The results are not yet to hand.

Other diseases under investigation during the year were:—

Wilt of antirrhinum (*Phytophthora sp.*)

Leaf spot of safflower (*Cercospora* sp.)

Storage rot of potatoes (*Fusarium* spp.)

Leaf spot of betel vine (*Colletotrichum*, *Vermicularia*, etc.)

Leaf disease of agave (*Phytophthora agave*), Leaf spot of turmeric (*Vermicularia curcumæ*) and fungoid diseases of insects.

#### F.—HORTICULTURE.

83. Mr. F. H. Butcher remained in charge of the Botanic Gardens and other Government Parks at Ootacamund and of Sim's Park, Coonoor, in addition to his other work.

84. *Botanic Gardens*.—The gardens were maintained in their usual good order and continue to be increasingly used by the general public. The outstanding feature of the gardens this year was the excellent show of carnations and sweet peas, which attracted the attention of visitors who purchased large quantities of plants and flowers. The sale of garden produce has increased and this side of the work is beginning to monopolise most of the time of the staff who might be more usefully employed.

85. *Sim's Park*.—This park continues to be a popular resort for all classes.

86. *Medicinal plants*.—*Ipomoea purga*. 608 lb. of tubers of this plant were planted in April 1924, and a year later gave a yield of 1,700 lb. Many of the tubers were small and the crop was obviously harvested prematurely. It was intended to leave the crop standing for two years, but as the tubers were required by the Medical Stores it was necessary to lift them.

87. *Cephaelis ipecacuanha*.—The plantation continues to make progress. The stock of plants now numbers 1,000. These are being grown under a pandal covered with plantain leaves which type of shade the ipecacuanha appears to prefer.

88. *Digitalis purpurea*.—Young seedlings were planted in May 1924 and matured by February of this year. One hundred and twenty pounds of leaves have been collected and will be tested for quality.

#### V.—LIVE-STOCK.

89. Mr. R. W. Littlewood was in charge of the section throughout the year. The most important event of the year was the taking over of the Hosūr Remount Depot and

converting it into the Central Cattle Farm, Hosūr. This station was taken over from the Army Remount Department on 1st September 1924. It consists of 1,635 acres of land, of which 65 acres are irrigable from tanks and are being used for growing irrigated fodder crops. The remainder is unirrigated pasture land, some of which is in a very poor condition owing to the fact that it has been used continuously as an exercising ground for horses and therefore carries very little grass. There are a large number of buildings which with slight alteration will accommodate 1,000 head of stock. The station is admirably suited for the purpose for which it has been acquired.

90. Consequent upon the acquisition of this station, a re-arrangement of the various herds under the charge of the Deputy Director, Live-stock, has been possible. The whole of the Kangayam herd, 18 of the best milking Ongole cows, 1 Ongole dairy bull and 9 calves from Chintaladēvi, the Montgomery herd from Coimbatore, all young stock of the various herds maintained at Coimbatore and some of the cross-bred bulls were transferred to Hosūr. Seven pairs of working cattle were transferred from Chintaladēvi and Coimbatore to Hosūr.

The herds now run as separate units are as follows:—

(1) Ongole herd, partly at Chintaladēvi and partly at Hosūr.

(2) Buffalo herd at Guntūr.

(3) Kangayam herd at Hosūr.

(4) Montgomery herd at Hosūr.

(5) Scind herd, partly at Hosūr and partly at Coimbatore.

(6) Half-bred herd previously known as the Bangalore herd, partly at Coimbatore and partly at Hosūr.

(7) Coimbatore herd, partly at Coimbatore and partly at Hosūr.

The policy being followed is to keep at Coimbatore a supply of good milking cows from the various herds together with their calves and the necessary bulls, transferring all young stock after they have been weaned and dry cows to Hosūr.

91. *The Ongole herd*.—At the end of the year under report, this herd consisted of 128 head of stock, viz.:—

|                      |                    |
|----------------------|--------------------|
| 77 cows and heifers, | 16 yearling bulls. |
| 4 breeding bulls,    | 31 calves.         |

Of these 28 are at Hosūr. There were 35 births and 2 deaths, 18 animals were sold of which 8 were bulls and 6 heifers—intended for breeding purposes. One bull was transferred to Hagari for breeding purposes. The average price obtained for 2-year old bulls was Rs. 180 and for cows and heifers Rs. 151. These were satisfactory prices. With this herd, the practice is to allow the calves to suckle their dams, but one day per week each cow is milked out fully in order to get some idea of yield. At Chintaladevi the average arrived at in this way was 11 lb. per day per cow in milk which is good. Four cows averaged 16 lb. per day.

92. *The Buffalo herd.*—This herd consisted of 34 head of stock, viz., 20 she-buffaloes and heifers, 4 bulls, 10 calves. Twelve animals were transferred from Coimbatore to this station. There were 13 births and 5 deaths during the year. One calf was still born. The average milk yield per buffalo in milk was 10 lb. This is low.

93. Two bulls were taken round to neighbouring villages and as a result 90 she-buffaloes were brought to the Farm for service. The total number of outside services were 93. one hundred and seventy pounds of ghee was made out of surplus milk and was sold in Madras. As a result of feeding a small quantity of fish-meal daily to two calves, one bull calf has made very good growth indeed and one heifer has taken the bull at the age of 2 years which is about 2 years earlier than normal.

94. *The Kangayam herd.*—There were 54 head of stock in this herd at the end of the year, viz., 41 cows and heifers, 1 bull, 6 yearling bulls and 6 calves. Of these, 31 heifers were purchased from the Pattagar of Palayakottai. There were 6 births during the year. Considering that this herd receive no concentrated food they maintain themselves in remarkably good condition.

95. *The Montgomery herd.*—The total number of animals in this herd at the end of the year was 13, viz., 6 cows and heifers, 1 bull and 6 calves.

There were 5 births during the year. One cow was sold. This herd has not proved a success in regard to milk yield and regular breeding and it is proposed to cross these cows with an Ayrshire bull and transfer the progeny to the half-bred herd.

96. *The Scind herd.*—At the end of the year under report, there were 37 head of stock in this herd, viz., 18 cows and heifers, 5 yearling bulls and 12 calves. Ten of these are at Hosūr. There were 12 births and 1 death during the year. One undersized bull calf was sold. This herd yielded 26,240 lb. of milk with a daily average of  $11\frac{1}{2}$  lb. per cow. The daily average for the whole herd was  $6\frac{1}{2}$  lb. Cow No. 25 is still the best cow in the herd. She calved in February and is giving over 20 lb. per day. Cow No. 24 which went dry prematurely due to mammitis maintained an average of 17 lb. of milk per day, a figure only slightly under her daily average for the previous lactation. Animals of this herd do very well both at Hosūr and Coimbatore and although receiving no better rations than the other herd keep in very much better condition. There are two or three very good yearling bulls which for their age are above the average size for this breed.

97. *The half-bred herd.*—This consists of the following:—Thirty-six cows and heifers, 8 bulls, 13 yearlings and 12 calves. Thirty-eight of these animals are at Hosūr. There were 11 births and 6 deaths during the year; one of the deaths was due to snake-bite. Three cows and 1 calf were sold for Rs. 560 and 1 young bull for Rs. 160. Two bulls were transferred to Madras, and 2 loaned to the Madura Municipality for stud purposes. Two bulls were given to the Superintendent, Central Farm, for work cattle.

The whole amount of milk yielded during the year was 45,731 lb. This averages 13 lb. of milk per day per cow in milk. This is low and is attributed to the outbreak of foot and mouth disease at Coimbatore in August last. Seven cows in the herd have yielded over 4,000 lb. in one lactation. The daily average per cow for the whole herd was 9 lb.

Cow No. 28 in 375 days averaged  $19\frac{1}{2}$  lb. of milk per day in her previous lactation, she was dry for 38 days and in this her present lactation has given over 4,000 lb. of milk in 166 days, the daily average being 26 lb.

Cow No. 7 in her previous lactation gave 5,062 lb. of milk in 315 days and is now giving over 30 lb. per day.

Cow No. 14 which calved in February 1923 is still in milk. She has yielded 11,732 lb. of milk in 783 days, the daily average being 15 lb. of milk.

All the animals in this herd are either the progeny of the first cross between Ayrshire and indigenous breeds or the progeny of such first crosses, the object being

to evolve a breed with the milking qualities of the Ayrshire combined with the constitution and resistance to disease of the indigenous breeds. There are a number of individuals of the F-1 and F-2 generations which do not conceive. This result is not unexpected and merely indicates the necessity for working with large numbers in order to allow of poor animals being discarded.

98. *The Coimbatore herd.*—This herd consists of animals of mixed blood, chiefly the progeny of crosses between indigenous and imported breeds. At the end of the year under report there were 76 head of stock in this herd, viz., 57 cows and heifers, 12 bulls, 17 calves. Forty-one of these are at Hosūr. There were 19 births and 10 deaths during the year. Four of the casualties were due to an outbreak of Pyroplasmosis at Hosūr in December last. The herd suffered a loss through the death of two of the best milkers No. 55 and 59. These animals were sisters and both suffered from tumour on the brain, one died and one had to be destroyed. Six animals were disposed of during the year. The herd yielded 60,570 lb. of milk with a daily average of  $12\frac{1}{2}$  lb. per cow, this latter figure is lower than last year which is due to the outbreak of foot and mouth disease which occurred at Coimbatore in August. The daily average on the whole herd was 8 lb. Nine cows have yielded over 4,000 lb. milk in one lactation. Cow No. 48 which gave 45 lb. of milk in one day went dry during the year. She yielded 8,406 lb. of milk in 426 days, the daily average being 20 lb. Cow No. 54 gave 8,033 lb. in 414 days with an average of  $19\frac{1}{2}$  lb. per day. She was dry for a short period of 67 days and she is now giving 19 lb. daily. Five daughters sired by the bull purchased from Pusa have yielded on the average 12 lb. of milk daily per cow in their first lactation. This is fairly satisfactory.

99. *Dairy.*—The total amount of milk obtained during the year was 140,344 lb. this is an increase of over 13,300 lb. over last year's figure, this difference would have been very much greater had it not been for the attack of foot and mouth disease to which reference has already been made. While the attack was in progress the daily milk yield fell from 550 lb. to 360 lb. Most of this milk was sold to customers on the Estate after the calves had been fed. In addition to the milk produced by the herds at the College, 88,330 lb. of outside milk and 1,798 lb. of outside cream were purchased. This gave 7,022 lb. butter which averages  $19\frac{1}{2}$  lb. per day.

100. The receipts from the Dairy for the year amounted to Rs. 24,420. The total amount realized from all stations by the sale of stock was Rs. 3,944, while Rs. 303 was received for service fees at Coimbatore, here again the latter figure is low due to two outbreaks of foot and mouth disease in the district.

101. *Madras milk supply.*—Five cross-bred bulls and 3 buffalo bulls were kept at stud in Madras during the year. Three hundred and sixty-one services were performed by these bulls, this is a considerable fall from last year's figure. This difference is due to the fact that any cow brought for service which would not take the bull without being tied up was turned away and the milkman was instructed to bring his cow again when she was properly in season. Two hundred and fifty-seven calves born to these animals were inspected during the year. It is regrettable to have still to report that the mortality amongst buffalo calves is very high, as much as 60 per cent.

In order to obtain some idea of the milk yields of the cross-bred and Ongole cows in Madras, milk recording for about 70 cows has been commenced at the General Hospital. The figures obtained up-to-date appear to be satisfactory.

102. *Ayrshire bull, Ootacamund.*—This bull Netherton-Knighthood performed 48 services during the year. Some very fine heifer calves born to this bull were inspected. One heifer in the College Dairy herd sired by this bull has calved and is averaging 25 lb. milk per day.

103. *Premia for maintaining bulls.*—Premia towards the maintenance of breeding bulls were granted to—(1) Mangalore District Advancement Association 3 bulls, (2) Coondapur 1 bull, (3) Kurnool 1 bull, (4) Katpadi 1 bull and (5) Sulagiri 1 bull.

104. *Poultry.*—4,304 and 434 eggs were laid during the year at Coimbatore and Hosūr, respectively. The receipts from birds and eggs amounted to Rs. 626.

105. *Pigs.*—At the beginning of the year 2 pigs were kept at Coimbatore. During the year 3 sows were purchased. One fat pig was sold for Rs. 67 and another young boar for Rs. 100. Thirty-one piglings were born and 8 died.

106. *Sheep.*—The flock of 170 sheep were transferred from Hagari to Hosūr in March last. They arrived in a miserably poor condition. Two lambs died in the train and 2 after arrival. Since their arrival with better feeding and proper attention they have improved considerably.

107. *Stud bulls in the districts.*—In addition to the bulls kept at stud at Coimbatore, Chintaladevi, Madras, Guntūr, and Ootacamund, stud animals are kept on several of the experiment stations. Four bulls and 2 buffalo bulls were kept in this way and performed 178 and 298 services, respectively.

• 108. *Ongole survey.*—M.R.Ry. M. V. Raghavulu Nayudu completed his survey of the Ongole cattle in Ongole taluk during the year. A detailed report is under preparation.

## VI.—DEMONSTRATION.

### A.—OPERATIONS AGAINST PESTS AND DISEASES.

109. *Application of the Pest Act to Cambodia cotton.*—No change was made in the area notified. As usual, operations were carried out in the taluks of Omalur, Tiruchengodu, Salem, Nāmakkal and Rasipuram in the Salem district; Karur, Kulittalai, Musiri, Trichinopoly and Lalgudi in the Trichinopoly district; and the whole of the districts of Madura and Coimbatore except Kollegal taluk.

As stated in last year's report, it was made clear that no extensions of time would be given in future. In spite of this, however, the time was again extended by one month to the 1st September, with the usual result, that the pulling up of the crop dragged on till the end of September in the VIII Circle, the middle of October in the V Circle and the middle of December in the VI Circle. The Act has now been amended, and if properly enforced, the uprooting of the crop should not in future be protracted over such a long interval of time.

110. *Application of the Pest Act to the coconut caterpillar.*—Operations were continued during the year. Owing to the steady spread of the pest along the lines of communication the area notified has had to be extended to cover the whole of the Mangalore taluk and the Act put into force for the period of another year as from January 1925. As was the case last year, difficulty was experienced in getting the provisions of the Act effectively carried out. On the plea of cheapness, the owners of gardens exercised their right to do their own cleaning. This was done in a half-hearted manner and the froads were not burnt. The natural result followed that the trees became infested again in a few months. In order to get over this difficulty the charge for cleaning by the special staff was reduced from one anna to three pies per tree with satisfactory results.

Work on the introduction of parasites of the pest was continued. There is evidence that the efforts of the Entomological staff, in this direction, are meeting with a measure of success.

111. *Mahali disease of arecanuts.*—An outbreak of this disease was reported from Hannavar magana in South Kanara, and steps were taken to deal with it. The co-operative societies working in this area purchased chemicals sufficient to spray 10,000 trees and 25 sprayers in their possession were circulated among the gardeners.

In South Malabar about three lakhs of trees were sprayed and 121 sprayers and chemicals sufficient to spray six lakhs of trees in the affected areas were sold. The co-operative societies financed the members and the staff of the Agricultural Department assisted in preparing the spray and seeing to the timely spraying of the trees. Between June and August two demonstrators, two head coolies and two messengers assisted by the trained hands of the special mahali class at Pattambi were kept busily employed. The operations were a success, thanks to the work of the co-operative societies. The disease did not spread to the same extent as previously experienced in years of heavy rainfall.

112. *The application of the Pest Act to palm disease in the Northern Circars.*—The operations of the Pest Act were continued. M.R.Ry. Rao Sahib V. Bhogappayya Sastri Garu, Deputy Collector, specially deputed for this work remained in charge of the operations throughout the year. As a separate report on this work has already been submitted in Mr. Anstead's letter R. Dis. No. D-82/25, dated the 26th February 1925, it will suffice to state here that the Act worked smoothly, that it was unnecessary to adopt coercive measures except in a very few cases only, that the owners of the trees willingly paid for the cutting charges and that according to the figures quoted below there are indications of a reduction in infection.

|                             | Godāvari. |         | Kistna. |        |
|-----------------------------|-----------|---------|---------|--------|
|                             | 1923.     | 1924.   | 1923.   | 1924.  |
| Outwardly infected trees.   | 4,927     | 5,107   | 949     | 646    |
| Dead ...                    | 12,189    | 11,215  | 2,500   | 894    |
| Surrounding infected trees. | 145,119   | 143,302 | 80,911  | 22,000 |

*Campaign against short smut on cholam.*

113. *Third Circle*.—As has already been reported the practice of the treating cholam seed with copper sulphate against smut is fairly well established in Bellary and Kurnool districts. 2,870 packets of copper sulphate sufficient to treat seed for 14,300 acres of crop were sold. There is evidence, however, that after following the practice for three or four years the cultivator omits this operation with the result that his seed becomes infected again.

114. *Eighth Circle*.—One hundred and eighty-three packets of copper sulphate were sold.

B.—CROPS.

(a) *Sugarcane*.

115. *First Circle*.—In this Circle work in connexion with this crop is directed towards the introduction of (1) better yielding varieties, (2) planting in lines, (3) improved furnaces and (4) better methods of wrapping and propping.

(1) *Varieties*.—The chief variety recommended for cultivation in this Circle is J 247. Good progress was made in the introduction of this variety in Vizagapatam and Gōdāvari districts, more especially in Sarvasiddhi taluk where the area was nearly doubled. Progress in Ganjām district was slight. The demand for setts was very keen and in order to meet the demand arrangements were made with ryots to sell their crops for seed purposes to their neighbours. In all, 81 tons of cane were sold for seed from the two stations in this Circle. This is equivalent to over 4 lakhs of setts.

Apropos of the question of seed supply the system adopted at Anakapalle deserves mention. This consists in planting a nursery in September, harvesting in six months and using the immature cane for seed purposes. The advantages of this method over the ordinary method of taking part of an eleven months' crop for seed are (1) there is time to take an early crop of another kind between June and August, (2) the cost of producing a ton of seed cane is reduced from Rs. 34 to Rs. 21-8-0, because in a nursery there is no need to prop or wrap the canes and (3) there is a very marked difference in the vigour of a crop raised from nursery cane as compared with one raised in the ordinary way.

(2) *Planting in lines*.—In Ganjām, this method of planting was demonstrated on a small scale. In Vizagapatam

district good progress was made in the introduction of this method of planting, 66 acres being planted in this way as against 18 last year. Several demonstration plots were laid down in villages where previously the method was unknown. In Gōdāvari district the area under this method of planting increased from 65 acres to 100. The greatest progress was made in the upland taluks under the jurisdiction of the Agricultural Demonstrator, Samalkota. In Tanuku taluk this method was demonstrated for the first time on an area of 10 acres.

(3) *Improved furnaces*.—Progress in the introduction of improved furnaces was made in the Yellamanchili sub-circle where 13 Gōdāvari and 3 Sindewahi furnaces were constructed under the supervision of the Assistant Agricultural Demonstrator. Also in the Chodavaram, Vizianagram and Bobbili sub-circles where 9, 11 and 8 improved furnaces were constructed. The total number of improved furnaces constructed during the year was 54 out of which 44 were in the Vizagapatam district and 10 in the Ganjām and Gōdāvari districts.

(4) *Better methods of wrapping and propping*.—In the northern taluks of Vizagapatam where the system of wrapping and propping is bad, the method followed on the agricultural station was demonstrated.

In this circle it has been found that trained coolies who are practical experts in all the operations connected with the sugarcane crop from preparing the land to building a furnace and making jaggery are much more effective in getting work done than are maistries who having once been given that title conceive that their duty ends with the wearing of a clean coat and standing on a bund exhorting some one else to work.

116. *Second Circle*.—In this circle sugarcane is a very minor crop. 500 lb. of setts of J. 247 were distributed during the year.

117. *Third Circle*.—Very little work was done in this circle. The use of the Sindewahi furnace was demonstrated in four villages in Kurnool district and of a slightly altered Poona furnace at Hospet.

118. *Fourth Circle*.—Work in this circle follows similar lines to that in the First Circle.

(1) *Varieties*.—J. 247 and Red Mauritius are the two chief varieties being distributed in this circle. The former is making rapid progress in Chittoor and North Arcot

districts. Over the whole circle the area under new canes has practically doubled itself each year since 1920-21 and is now 760 acres.

(2) *Planting in lines with wide spacing.*—Good progress was made in the introduction of this method of planting, the area of cane so planted increased from 350 to 620 acres.

(3) *Improved furnaces and pans.*—The use of the Sindewahi furnace is now spreading naturally as is also the use of the improved type of pan. It is reported that 100 furnaces were constructed by cultivators without any assistance from the department. The number of furnaces in this circle erected with the help of agricultural officers is now 604 as compared with 470 last year. It is gratifying to note that the number of pans supplied through the agency of the department decreased from 170 to 101, as this indicates that the cultivators are obtaining their own supplies direct from Madras.

(4) *Mills.*—Nine Chattanooga mills were sold in the circle.

119. *Fifth Circle.*—In this circle also very little work was done. Eight Sindewahi furnaces were constructed during the year.

120. *Seventh Circle.*—The chief variety being distributed in this circle is Red Mauritius. In South Kanara cane appears to have reached its limit of extension. About 4,000 acres are under cane in this district. In Malabar the area increased slightly to 10 acres. Twenty-one Sindewahi furnaces and 4 double furnaces were made during the year.

121. *Eighth Circle.*—(1) *Varieties.*—1,500 setts of Co. No. 1 and Java Hebbal canes were distributed.

(2) *Improved furnaces.*—Five Sindewahi furnaces were constructed during the year.

(3) *Mills.*—Two Chattanooga mills were sold.

(b) *Paddy.*

122. The main lines of demonstration work connected with this crop are (1) the introduction and spread of better varieties, (2) the reduction of seed rate and economic planting, and (3) manuring.

123. *First Circle.*—(1) *Varieties.*—The main varieties distributed in this circle are Rasangi, G.E.B. 24, Palagummaseri and Garikasannawari, the greatest demand being for Rasangi. The demand this year was greater than the

supply. In all, 41½ tons of seed were sold. The swampy varieties of paddy supplied from Samalkota are gaining favour with the cultivators near the Kollair lake and now occupy an area of 800 acres.

(2) *Reduction of seed rate and economic planting.*—It is not now possible to give accurate figures for the area affected by these improvements. The figures quoted below refer to definite increases which have occurred in tracts where demonstration was carried out last year.

In Ganjam, in Berhampur and Chicacole taluks, the area under economic planting increased from 120 to 240 acres.

In Vizagapatam district the area under economic planting increased by over 1,400 acres. In Gōdāvari district, in Amalapur and Rajahmundry taluks, the area under economic planting increased by over 5,000 acres.

(3) *Manuring.*—(a) *Green manure.*—Very good progress was made in the spread of this improvement more particularly in the Vizianagram sub-circle where 7,842 lb. of green-manure seeds were sold this year as compared with 539 lb. last year. In all in this circle, the following quantities of seed were sold. Dhaincha, 4,690 lb., sunnhemp, 2,020 lb., Indigo, 7,780 lb., Wild indigo, 2,450 lb.

(b) *Other manures.*—The use of fish guano and of bone meal in conjunction with green manure was advocated. Thirty tons of fish guano and seven tons of bone meal were sold.

124. *Second Circle.*—(1) *Varieties.*—In this circle the work being done is not strictly demonstrational. 8,375 lb. of seed of the following varieties G.E.B. 24, Co. No. 1, Co. No. 2, Co. No. 91, and Garikasannawari were sold during the year.

(2) *Economic planting.*—In Nellore district the area of crop under this method increased to 2,000 acres.

(3) *Manuring.*—(a) *Green manures.*—Good progress was made in spreading the practice of using green manures for this crop, particularly in the case of wild indigo in Rēpalli taluk. In all in this circle 5,400 lb. of dhaincha and 81,000 lb. of wild indigo seed were sold.

(b) *Other manures.*—The chief manures other than green manure being distributed in this circle are fish guano, superphosphate and bone meal. The quantities sold this year were 131, 12, and 35 tons, respectively.

125. *Third Circle.*—*Economic planting.*—This practice is making steady progress in this circle, particularly under the

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Cumbum tank where three-quarters of the crop grown there is planted in this way.

126. *Fourth Circle*—(1) *Varieties*.—A number of varieties are being distributed in this circle and in all 18,933 lb. of seed were sold.

(2) *Economic planting*.—It is estimated that nearly 15,000 acres of crop were planted this year in this circle in this way. The area here depends very much on the season. If the rains are received late, broadcasting is preferred to transplanting.

127. *Fifth Circle*—(1) *Varieties*.—A large number of varieties and strains are being distributed in this circle. Aduturai Nos. 1 and 2, however, are the chief. The total amount of seed sold was 72,000 lb., of which 52,000 was of these two strains.

(2) *Reduction of seed rate and economic planting*.—A very large area is now normally planted at a reduced seed rate per acre, as compared with the old rate of 36 to 48 Madras measures per acre. The maximum reduction aimed at, however, is from 8 to 12 Madras measures per acre and at this rate it is estimated that about 33,000 acres have been planted this year.

(3) *Manures*—(a) *Green manure*.—The practice of growing green manure crops for manuring paddy is well established in this circle. The following quantities of seed were sold during the year:—Dhaincha, 5,370 lb.; wild indigo, 51,610 lb.; sunnhemp, 500 lb.; indigo, 1,540 lb. It is estimated that about three times this total quantity of seed was obtained by ryots through other agencies than the Agricultural Department.

(b) *Other manures*.—In this circle no manures are stocked by the Department. Prospective buyers are given advice and are referred to manure firms and to the Co-operative Societies at Nidamangalam and Shiyali. It is understood that considerable quantities of manures, chiefly fish guano, phosphatic manures and oil-cakes were purchased by the ryots.

128. *Sixth Circle*.—(1) *Varieties*.—Strains produced at Aduturai and Vedapatti stations are being distributed in this circle. In all, 3,200 lb. of seed were sold.

(2) *Economic planting*.—This year, 1,160 acres were planted at the rate of from 7 to 12 Madras measures as against the prevailing rate of 30 to 40 Madras measures.

(3) *Manures*—(a) *Green manures*.—In this circle, the practice of green manuring for paddy is well established and the figures for seed sold by the department are no real indication of the extent to which the practice prevails. 41,600 lb. of wild indigo seed and 7,200 lb. of dhaincha seed were sold.

(b) *Other manures*.—The two chief manures distributed were fish manure and phosphatic manures. Of the former, 35 tons were sold and of the latter 8 tons. These manures are supplied by Messrs. Parry & Co. on consignment account and are stocked for sale in depots run by the department.

129. *Seventh Circle*—(1) *Varieties*.—Seed from Taliparamba is being distributed in the district, the amount disposed of this year being 5,000 lb. Some 27,000 lb. of seed was arranged for locally and was distributed in the flooded area. This seed had no particular merit; it was obtained to supply to ryots who otherwise would have gone without.

(2) *Economic planting*.—It is reported that the area planted in this way is on the increase. In the Udipi sub-circle the area increased from 250 to 300 acres.

(3) *Manures*—(a) *Green manures*.—2,000 lb. of wild indigo seed and 500 lb. of dhaincha seed were sold during the year.

(b) *Other manures*.—Little could be done with fish manure this year as the catch was poor. In all 19 tons were sold during the year. A small quantity of bone meal, 450 lb. was distributed.

130. *Eighth Circle*—(1) *Varieties*.—The principal strains being distributed in this circle are G.E.B. No. 24, Co. No. 91, and Co. No. 1. In all, nearly 18,000 lb. of seed was sold during the year.

(2) *Economic planting*.—It is reported that in the Bhavani tract the seed rate has been reduced to 10 Madras measures per acre and that in the Amaravati valley a considerable reduction of seed rate has been effected. The practice is also extending in Salem district.

(3) *Manures*.—(a) *Green manure*.—Good progress was made with the spread of this practice during the year. It is estimated that the area under green-manure crop in this circle increased from 16,200 acres to 17,500. During the year 11,600, 15,900 and 4,900 lb. of wild indigo, dhaincha and sunnhemp were sold in this circle.

(b) *Other manures*.—Small quantities of phosphatic manures were distributed for test.

## (c) Cotton.

131. The demonstration work connected with this crop consists in (1) the introduction and spread of superior strains and (2) in the V, VI and VIII circles, the introduction and spread of the practice of drilling.

132. *Third Circle—Hagari No. 25.*—The 1923-24 crop of cotton was poor with the result that there was a shortage of this cotton in Bellary district. The department distributed only 111,327 lb. of seed of this cotton this year as against 181,000 last year. It is, however, estimated that the area under this strain increased from 81,000 acres to 179,570 acres. Had more seed been available it is probable that the area under this strain would have been greater still. About 60 bales of lint of the 1923-24 crop belonging to ryots were sold through the agency of the department at a premium of nearly Rs. 13 per bale. The remainder was sold by the ryots themselves at a premium of from Rs. 5 to Rs. 10 per bale.

*Nandyal No. 14.*—The total quantity of seed of this cotton sold during the year was 112,000 lb. and the total area sown to this strain was 20,180. This strain is reported to have given a better yield this year than the local cotton. About 1,030 bales of lint of the 1923-24 crop were sold through the agency of the department at an average premium of Rs. 40 per bale.

*Cambodia cotton.*—39,000 lb. of seed were distributed during the year.

133. *Fourth Circle.*—The cultivation of Cambodia cotton is on the increase. 12,420 lb. of seed were sold this year. This, however, does not represent the total demand for this seed. The area under this crop in this circle is estimated at 7,500 acres of which about 4,000 acres is not irrigated.

134. *Fifth Circle—Cambodia cotton.*—The quantity of Cambodia seed distributed in this circle was 20,583 lb. sufficient for 2,058 acres of crop. In 1,500 acres the crop was planted in lines

135. *Sixth Circle—Karunganni cotton.*—As was stated in the case of the eighth circle last year, a change was made during the year from the old style seed farm conditions under which the department bound itself to purchase the whole produce of the seed farm, to the new conditions under which the department limits its purchase to the seed only but undertakes to aid the ryot in disposing of his lint. Here let it be said that the new type of seed farm is new only in

the sense that it is being tried for the first time in this circle. The method was originally tested in the third circle.

There were practically 204 acres of seed farm in this circle, half under the old and half under the new conditions. There was a loss of Rs. 2,140 on the year's working. This is entirely due to fluctuation in the price of lint. When all the seed farms are run under the new conditions there is no reason why they should not be made to pay their way. In all 63,170 lb. of Karunganni seed were distributed from seed farms during the year.

*Seed unions.*—There were eleven seed unions working in this circle during the year. The total area under pure Karunganni cotton controlled by these unions was 1,926 acres and the total quantity of seed obtained was 248,000 lb. of which 217,740 lb. were used for sowing.

*Drill cultivation.*—There was an increase of 3,000 acres in the area sown with the seed drill in this circle. The total area so sown was 12,500 acres of which 10,250 acres were drilled by the ryots themselves. Fifty-six drilling sets were sold this year. The total number of setts now in use in the circle is put at 463. Ryots are beginning to make their own setts.

136. *Eighth Circle—Cambodia cotton.*—The area of seed farms in this circle was 1,137 acres in the 1923-24 season. Of this area 284 acres were under the old conditions and the remainder under the new. The total quantity of seed obtained from these farms was 245,100 lb. all of which was sold to cultivators. The lint obtained from these seed farms was sold by auction by the Department. The prices realized were Rs. 445, Rs. 441, and Rs. 438 per candy of 500 lb. when the rate for ordinary Cambodia was from Rs. 435 to Rs. 420 per candy of 520 lb. In this market where so much mixing is done the fact that this cotton is known to be pure is probably sufficient explanation for the difference in price quoted.

*Karunganni cotton.*—25,000 lb. of seed obtained from VI Circle was distributed in this circle during the year.

*Drill cultivation.*—371 acres of cotton were sown in lines and 170 acres were bullock-hoed.

## (d) Coconuts.

137. Considerable progress was made in the VII Circle in spreading the dry system of cultivating coconuts. In addition to the 40 plots cultivated in this way last year,

131 plots in South Kanara and 30 plots in Malabar were brought under this method. The demand for seed nuts increased during the year and 2,450 nuts and 2,750 seedlings were distributed from the coconut stations.

(e) *Potatoes.*

138. *Nilgiris.*—As in last year, seed was produced under seed farm conditions. The area this year was, however, only 10 acres as compared with 12 acres last year. The season was rather better this year than last. The return was from 3 to 5 fold and 2,000 lb. of seed potatoes were obtained.

139. *Shevaroyis.*—The area of seed farm increased from 4 acres to 9 this year. The total area under potato cultivation was increased to 18 acres. The season, however, was unfavourable and the yields were poor.

C.—MANURES.

140. In addition to the green manure seed and other manures to which reference has already been made, the following quantities of manure were distributed :—

141. *Third Circle.*—Fish guano 48 tons at Hospet, Nandyal and Cuddapah; oilcake 5 tons, and bone meal 6 tons.

142. *Fourth Circle.*—Fish guano 17 tons, phosphatic manures, chiefly bone meal 14 tons, and other manures 3 tons. It is understood that Messrs. Parry & Co. sold 508 tons of manure in this circle during the year.

D.—IMPLEMENTS.

143. *First Circle.*—Special efforts were made during the year to extend the use of light iron ploughs, and arrangements were made to stock plough at the agricultural station and the depots in the circle. Nine Monsoon, 38 Meston and 35 Konkan ploughs were sold this year as against 9 Monsoon and Konkan ploughs sold last year.

144. *Second Circle.*—In this circle good progress was made, more particularly in the Nellore sub-circle where the conditions are distinctly favourable. The number of ploughs sold was as follows: Jat 1, Meston 14, Konkan 69, Monsoon 5. In addition 47 shares were sold.

145. *Third Circle.*—Very good progress was made this year in extending the use of iron ploughs. The number of heavy ploughs sold rose from 1 last year to 37, viz., 8 cotton soil, 6 Sabul, 28 Kirloskar; and of light ploughs from 123 to 219, viz., 138 Monsoon, 20 Malwa, 1 Climax, 58 Konkan and 2 Meston ploughs. In addition 150 shares and 17 hand chaff-cutters were sold.

146. *Fourth Circle.*—The number of ploughs sold in this circle rose from 308 to 498 which shows satisfactory progress. Of these, 389 were Konkan, 85 Monsoon, 23 Jat and 1 Victory. The last named plough is coming into favour for trenching sugarcane. A few other implements were also sold. In addition 1,405 spare parts were sold.

147. *Fifth Circle.*—Work in this circle makes slow progress. Two hundred and thirty-three light ploughs were sold, of which 192 were Konkan, 24 Meston, 2 Victory and 15 Monsoon. A few other implements were sold.

148. *Sixth Circle.*—Satisfactory progress was also made in this circle. In all 360 ploughs were sold, of which 120 were Monsoon, 128 Meston, 64 Climax and 37 Konkan. In addition, 658 spare parts were sold and including 45 drilling sets. One hundred and thirty-four other implements were sold.

149. *Seventh Circle.*—In this circle, the Meston plough is the only one being used. Two hundred and thirty-two were sold this year along with 83 shares. Of other implements the most noteworthy feature is the sale of 121 sprayers.

150. *Eighth Circle.*—Eighty-four ploughs—23 Monsoon, 32 Meston, 24 Konkan—and 338 spare parts were sold in this circle.

151. In all, 1,834 ploughs and 2,681 spare parts were sold during the year. This may be considered satisfactory. The most encouraging feature of this year's work is the large sale of spares, which indicates that the ploughs are being used fairly regularly. The most popular among the ploughs are the Konkan, Meston, and Monsoon. These are low in price which is at present the first consideration. It is too early yet to expect the cultivator to be discriminating in his choice of a plough and pay much attention to other matters than price.

E.—MISCELLANEOUS.

152. Full advantage was taken of fairs, festivals, jama-bandi camps and the like to hold small exhibitions, to

demonstrate the use of different implements, to deliver lectures illustrated by lantern slides, to distribute leaflets and to sell calendars, seed, etc. It is doubtful whether much good is done at a jamabandi camp.

153. *Co-operation*.—Apart from the fact that Agricultural officers in all circles are taking advantage of meetings organized by the Co-operative Department there is little to report. In the fourth circle, 127 agricultural implements and 8 tons of bone-meal were sold through the agency of co-operative societies. In the seventh circle, good work was done by the two departments working in combination, as has already been mentioned in reference to Mahali disease. There is no doubt that much more could be done by the combined activities of the two departments, but both must develop before this can happen. As much as can be done at present is being done.

154. *Criminal settlements*.—The following criminal settlements were visited by the officers of the Agricultural Department and advice given with reference to the agricultural side of the operations of the Settlements:—

Bitragunta, Allur (Kavali), Stuartpuram, Sitanagram and Aziznagar.

Certain suggestions for the improvement of irrigation facilities in the Sitanagram and Stuartpuram Settlements were made by the Deputy Director of Agriculture, II Circle, and a detailed report on the condition of the Aziznagar Settlement with suggestions for its improvement was made by the Deputy Director of Agriculture, IV Circle. Reports of the inspections made are communicated to the Labour Commissioner from time to time.

155. *Agricultural Association*.—A list of these associations was recently submitted to Government. None of them are doing useful work. Two associations were recently started, one at Villupuram and one at Tinnanur. At both these functions the Director of Agriculture delivered the inaugural address. It remains to be seen what work they will accomplish.

## VII.—AGRICULTURAL ENGINEERING.

156. As was pointed out in last year's report until a research engineer is appointed we can undertake no research along this line.

## VIII.—PUBLICATION AND SUPPLY OF INFORMATION.

157. The undermentioned leaflets were published during the year under report:—

| Leaflet No. | Subject.                                                            | Author.                               | Languages in which published.                                                          | No. of copies.                            |
|-------------|---------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------|
| 38          | The Army Worm of Paddy.                                             | M.R.By. Rao Sahib Y. Ramachandra Rao. | English ... ..<br>Tamil ... ..<br>Telugu ... ..<br>Malayalam ... ..<br>Kanarese ... .. | 2,000<br>5,000<br>4,000<br>1,500<br>1,500 |
| 39          | Tobacco Aphis ...                                                   | Do.                                   | English ... ..<br>Tamil ... ..<br>Telugu ... ..<br>Malayalam ... ..<br>Kanarese ... .. | 1,500<br>4,000<br>4,000<br>1,000<br>1,000 |
| 40          | Hints to utilize sanded area in Trichinopoly and Tanjore districts. | M.R.By. N. S. Kulandaiswami Pillai.   | Tamil ... ..                                                                           | 5,500                                     |

158. A Year Book of the Agricultural Department for 1924 is in the Press.

159. The Villagers' Calendar for 1924-25 was published as usual in English, Tamil, Telugu, Malayalam, and Kanarese, the total number of copies printed in all the languages being 81,600 for sale and distribution.

160. The Monthly Digest is published in four languages, English, Tamil, Telugu and Malayalam, for distribution. They are widely circulated among ryots through the Revenue and Co-operative departmental agencies and important newspapers. The research work of Mr. M. R. Ramaswami Sivan on the "Phosphatic Nodules of Trichinopoly and the Availability of Flour Phosphate as a Manure for Paddy" formed the subject of a Memoir of the Imperial Department of Agriculture.

161. The following papers were sent for being read at the Imperial Botanical Conference held in London in July 1924:—

- (1) "Revival of Botanical Survey in the Madras Presidency."
- (2) "Uniformity in Botanical Nomenclature."
- (3) "Virus Theory in relation to Spike Disease in Sandal."

162. The undermentioned papers were also issued during the year from the various sections :—

(1) "Some observations on the Flowering Phase of two wild species of *Oryza* *O'Longistaminata* and *Oryza latifolia*" for the Indian Science Congress.

(2) "Chemistry of Sugarcane," Part III.

(3) "Some Factors Influencing Nitrification in Coimbatore Soils."

(4) "Relative Nitrifiability of Different Organic Nitrogenous Manures in the Type Soils of the Central Farm."

(5) "The Effect of Phosphate Fertilizers on the Solubility of Calcium and Potassium in some South Indian Alkali Soils."

(6) "The Distribution of Mineral Matter in the different parts of the Coconut Tree."

(7) "The Manurial Requirements of the Plantain."

(8) "Pollu Disease of Pepper."

(9) "Some Fungus Diseases of Coffee and their control." (Paper read at the M.A.S.U. Conference.)

(10) "A new treatment of the Ring Disease of Potatoes." (Paper read at the M.A.S.U. Conference.)

(11) "Mycological Aid to the Planting Community."

(12) "Report on a tour to the Laccadives and Minicoy."

(13) "Progress of Mycological Work in Madras."

(14) "Natural Crossing in Summer Cholan."

(15) "Segregation for Anther Colour in *Andropogon Sorghum* (Benares Session of the Indian Science Congress)."

(16) "Crossing of small grains made Easy." (Agricultural Journal of India.)

(17) "Insect Pests of Market Gardens with suggestions for Control."

(18) "The Bionomics of some Parasitic Hymenoptera in South India."

(19) "A New Coccinellid Beetle of Economic Importance."

(20) "List of Psyllidae Recorded from India."

(21) "The Fruit Moth Problem in Northern Circars."

(22) "A Thripid Gall in *Calycopteris Floribunda*."

#### IX.—ACCOUNTS.

163. *Agricultural loans*.—No application for the grant of loans for the purchase of agricultural implements or machinery was received during the year under report.

164. The receipts and expenditure for the year under report and the corresponding figures for the previous year are given below :—

|                 |     | 1923-24.  | 1924-25.  |
|-----------------|-----|-----------|-----------|
|                 |     | RS.       | RS.       |
| Expenditure     | ... | 14,47,949 | 13,72,179 |
| Receipts        | ... | 3,54,655  | 2,51,500  |
| Net expenditure | ... | 10,93,294 | 11,20,679 |

The figures for 1924-25 are those extracted from the departmental accounts.

165. Under the new system of seed farms the department no longer purchases kappas but only seed and this has largely contributed to the decrease both under receipts and expenditure.

#### X.—STATISTICS.

166. The usual reports and returns were issued during the year and press summaries were also published promptly in the newspapers.

167. *Weekly season reports*.—The weekly season reports from the States of Travancore, Cochin, Pudukkōttai, Banganapalle and Sāndūr were discontinued as these states were brought into direct political relations with the Government of India.

The reports have been simplified, mention of sowings and harvests being restricted to important crops in their important seasons.

168. *Annual season and crop report*.—Charts and diagrams showing the distribution of cultivation, crops, and prices were added to the season and crop report of 1923-24.

169. The quinquennial census of live-stock was taken in the year and the results were published in the Season and Crop report. The form of the return was revised so as to distinguish bulls kept for breeding from bulls used entirely for work. Consequently the figures of bulls and bullocks in the present census appear to be more reliable than before.

170. *Forecasts*.—The areas estimated in the crop forecasts in 1923-24 differed from the actuals by 0.1 to 0.4 per cent for castor, sugarcane and cotton, 0.6 for groundnut, 1.1 for paddy, and 3.4 for gingelly.

Proposals were submitted to Government to revise the calendar of the groundnut forecasts with a view to show the summer and winter crops separately and to issue them earlier in the crop season.

The form of the crop forecast return due from Tahsildars was slightly revised in the year.

171. *Weekly cotton mill and press returns.*—The question of reviving the monthly returns of the movements of cotton by rail was placed before Government but negatived.

172. *Crop-cutting experiments.*—No crop-cutting experiments were conducted in this Presidency for want of money and staff. The feasibility of modelling future experiments on the Bihar method referred to at page 46 of the Proceedings of the Board of Agriculture, 1924, is now under consideration.

173. *Village and taluk accounts.*—The Board of Revenue was requested to issue amendments to the Manual of Village Accounts requiring that the area under different varieties of cotton may be recorded separately in the important cotton growing districts. The Board has since stated that the necessary instructions on this account can be issued in the village sheet of the District Gazette as they relate only to a few districts.

174. *Weights and measures.*—Certain clerical errors in the revised conversion table of weights and measures were brought to the notice of the Board of Revenue and rectified.

175. *Inspections.*—The Statistical Assistant inspected the statistical registers relating to crops and prices in the Collector's office at Bellary, and in the taluk offices of Kovur (Nellore district), Adoni, Bellary and Hospet.

The Statistical Assistant delivered lectures to the students in the Agricultural College, Coimbatore, on Land Revenue and Settlement in February.

176. *The Provincial Cotton Committee.*—The Provincial Cotton Committee was reconstituted in the year and now consists of three officials, three non-officials elected by the Chambers of Commerce, and three non-officials nominated by Government.

Two meetings of the Provincial Cotton Committee were held in the year, on the 25th August 1924 and 19th March 1925. Colonel French, Assistant Director, Empire Cotton Growing Corporation, London, and Mr. Jackson, Member, Executive Committee of the Corporation, who were touring

in India attended the latter meeting as visitors. The Secretary, Indian Central Cotton Committee, attended both the meetings. The working of the Pest Act and the application of the Cotton Transport Act to the principal cotton tracts in Madras were the most important subjects discussed.

177. *Local cotton committees.*—The Local Cotton Committee at Tiruppur met during the year to consider the limits of the Tiruppur Cambodia area requiring protection under the Cotton Transport Act.

178. *General.*—The Empire Cotton Growing Corporation, London, forwarded a questionnaire on cotton transport conditions and requirements in the Madras Presidency. A note on the subject was prepared and sent.

#### XI.—PROGRAMME OF WORK, 1925-26.

179. *Agricultural Stations.*—The main lines of work will be those which have been previously recorded in this report. The usual varietal, cultural and manurial experiments will be carried out at the various agricultural stations, with reference to the existing or potential crops of the tracts served by them.

180. *Paddy.*—At Coimbatore, the Government Economic Botanist will continue the present lines of work, viz., the raising and testing of single plant selection of local varieties together with pure strains derived from crosses. A study of the inheritance of characters will be continued on Mendelian lines.

At Aduturai the survey work of the Cauvery valley and the delta will be completed. The trial of the deep water paddies of Bengal will be extended. The new single plant selections made last year and the F-1 of the crosses made between Kar and Kuruvai, will be carried further. The large number of fresh single plant selections made in the small grained Nellore samba and Korangu samba will be studied, the main consideration of the study of the latter being to get a strain free from or resistant to "Blast." The large number of selections from the promising cross white Sirumani  $\times$  Java paddy will be grown on plots and will be studied in detail.

181. *Millets.*—The study of the modes of pollination of the various millets and the technique of their crossing will be continued. The isolation and close study of pure lines in cholam and ragi; and a general study of the populations of

the other millets will be carried out. Single plant selection for improvement in yield on (1) the Peria Manjal cholam of the Coimbatore tract, (2) the tella jonna of Bellary, and (3) the pattsa jonna of the Nandyal area will be tested.

182. *Cotton*.—Testing and comparing yields of strain Nos. 664, 440 and 295 Cambodia with local Cambodia. Isolation of pure types from Roseum and Indicum cross. The F-4 generation will be grown and studied. Isolation of pure types from Cernuum and Indicum cross. The F-3 generation will be grown and studied. Isolation of pure types of Sea Island and Cambodia cross. The F-3 generation will be grown. Crossing Indicum and Million dollars cotton obtained from Nanking, China. Continuation of Herbaceum selection work under the Indian Central Cotton Committee's grant.

183. *Manures*.—Experiments to test the different methods of storing cattle manure, the value of cyanamide, and of bonemeal and Trichinopoly flour phosphates in conjunction with green leaves and different organic manures will be continued. Work on the preparation of artificial farm yard manure from waste products will be further investigated.

184. *District work*.—The development of district work will, subject to the limits imposed by staff and funds available, proceed on the usual lines, viz., the purchase and sale, not only departmentally, but by means of private depots, co-operative societies, and seed unions, of Cambodia and local varieties of cotton and green-manure seeds; the distribution of selected strains of paddy, cotton, cholam, ragi, maize, sugarcane and groundnut; the demonstration and introduction on ryots' own lands of economic planting of paddy, cotton and sugarcane; improvements in the preparation of jaggery; the raising and transplanting of paddy seedlings in preference to broad-cast sowing; the use of green manure, fish-guano, oil-cakes and bonemeal, and the improved methods of preservation of farm yard manure; the use of improved agricultural implements, including not only iron ploughs, but chaff-cutters, clod-crushers, etc.; and the enforcement of the Local Pests and Diseases Act, 1919, for the eradication of palm disease, the removal of Cambodia cotton by the prescribed date, and the eradication of the coconut caterpillar in Mangalore.

185. *Chemistry*.—The soil survey of Malabar will be continued and the following items will receive special attention. The study of analytical methods, the fermentation of

tea, the influence of sulphur in composts on the solubilization of mineral phosphates, the nitrification of soils, and the bacteriological diseases of various crops.

186. *Botany*.—A survey and study of the weeds of cultivation will be continued and herbarium work done. The usual teaching work at the College will be carried on.

187. *Mycology*.—The following subjects will receive special attention in addition to routine work; Rhizoctonias of various crops, "Pollu" disease of pepper, fruit fall of mangoes, cardamom disease, *Sclerospora* of cholam, *Helminthosporium* and "blast" of paddy, *Vermicularia* of Bengal gram, Betel vine disease, and methods of preventing Red Rot of sugarcane and ring disease of potatoes. The usual teaching and systematic work will be done.

188. *Entomology*.—Checking of the effect of the enforcement of the Pest Act against the Pink boll-worm on Cambodia cotton and a continuation of a study of the bionomics of that insect. The bionomics and control of *Schaenobius incertellus* (the paddy stem borer), *Calocoris angustatus* on Sorghum, *Spodoptera mauritia* on paddy, Mango hopper and fruit moths. Control of *Nephantis* on coconut at Mangalore especially as regards the possibility of controlling it biologically by parasites. Demonstration of control measures for the hairy caterpillar pest in South Arcot and Madura districts. An investigation of the Betel vine disease at Singanallur and trial of experiments in conjunction with the Chemist and the Mycologist. Continuation of the investigation of "Pollu" disease of pepper in conjunction with the Mycologist at Taliparamba. Control of Hieroglyphus banian in Ganjam and Vizagapatam districts. Trial of control measures against the fruit-fly in Coonoor and Kallar. Systematic work on Parasitic Hymenoptera, certain groups of aculeate Hymenoptera, certain families of Homoptera, including Aphididæ, Thysanoptera, Acarina, Anthomyiidæ, Cecidomyiidæ, Tachinidæ, Syrphidæ, etc. Rearing and collection of crop pests for supplying specimens to the various circles.

189. *Livestock*.—The present work of evolving a new dairy type of cow by crossing with imported stock will be continued. The Ongole survey will be completed and a good Ongole herd built up at Chintaladevi.

Buffalo breeding work will be carried out at Guntur. Fodder crops will be studied and breeding bulls will be maintained in as many centres as possible.

The stock at the new Central Cattle Station will be added to and it is hoped that a beginning will be made in sending a steady supply of milk to Madras.

190. *Agricultural education.*—The construction of the new college buildings at Coimbatore is still in progress, but will probably be completed during the course of the year. The degree course will be continued. To this and ordinary propaganda work the Department should limit its activities in respect of agricultural education for some time to come.

I have the honour to be,

Sir,

Your most obedient servant,

G. R. HILSON,

*Officiating Director of Agriculture.*

# APPENDIX A.

*Area under main crops in each agricultural division (average of six years ending 1921-22).*

(Figures in thousands of acres, i.e., 000 being omitted.)

| Crop.             | 1st<br>division. | 2nd<br>division. | 3rd<br>division. | 4th<br>division. | 5th<br>division. | 6th<br>division. | 7th<br>division. | 8th<br>division. |
|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                   | ACS.             | ACS.             | ACS.             | ACS.             | ACS.             | ACS.             | ACS.             | ACS.             |
| Paddy ...         | 3,512            | 1,298            | 382              | 1,862            | 1,410            | 1,049            | 1,468            | 300              |
| Cholam ...        | 318              | 1,051            | 2,121            | 147              | 239              | 547              | ...              | 701              |
| Cumbu .           | 288              | 392              | 411              | 483              | 346              | 454              | ...              | 847              |
| Ragi ...          | 685              | 117              | 230              | 493              | 138              | 287              | ...              | 515              |
| Korra ...         | ...              | ...              | 1,166            | ...              | ...              | ...              | ...              | ...              |
| Other cereals ... | 338              | 644              | 296              | 383              | 270              | 572              | 38               | 387              |
| Pulses ...        | 632              | 333              | 725              | 190              | 97               | 357              | 71               | 636              |
| Gingelly...       | 360              | ...              | ...              | 105              | 57               | 113              | ..               | 71               |
| Groundnut ...     | ...              | ...              | 351              | 602              | 169              | 80               | ...              | 138              |
| Coconut ...       | ...              | ...              | ...              | ...              | ...              | ...              | 382              | ...              |
| Castor ...        | ...              | 119              | 193              | ..               | ...              | ...              | ...              | ...              |
| Chillies ..       | ...              | 128              | ...              | ...              | ...              | ...              | ...              | ...              |
| Pepper ...        | ...              | ...              | ...              | ...              | ...              | 1                | 71               | ...              |
| Sugarcane ...     | 48               | ...              | ...              | ...              | ...              | ...              | ...              | ...              |
| Cotton ...        | ...              | 230              | 1,045            | ...              | 50               | 703              | ...              | 308              |
| Indigo ...        | ...              | 96               | ...              | 54               | ...              | ...              | ...              | ...              |
| Tobacco ...       | 63               | 63               | ...              | ...              | ...              | ...              | ...              | 87               |
| Arecanut ...      | ...              | ...              | ...              | ...              | ...              | ...              | 90               | ...              |
| Plantains ...     | ...              | ...              | ...              | ...              | ...              | ...              | 44               | ...              |
| Other crops ..    | 720              | 444              | 349              | 295              | 198              | 360              | 248              | 253              |
| Total ...         | 6,944            | 4,915            | 7,269            | 4,614            | 3,024            | 4,502            | 2,412            | 4,189            |

# Government of Madras

DEVELOPMENT DEPARTMENT

**G.O. No. 1377, 19th September 1925**

Agriculture—Administration Report—1924-25—Recorded with remarks.

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READ—the following paper :—

*Letter from G. R. HILSON, Esq., B.Sc., Officiating Director of Agriculture, Madras, to the Secretary to Government, Development Department, dated the 31st July 1925, No. D. 45 Pdl./25.*

[Copy attached.]

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**Order—No. 1377, Development, dated 19th September 1925.**

Recorded.

2. The unfavourable seasonal conditions of the year under review to some extent interfered with the normal activities of the department in the greater part of the Presidency, but in spite of disastrous floods on the East and West coasts at one period and deficiency of rainfall at another, steady progress was made in most branches of work, which reflects credit on the Director, Mr. R. D. Anstead, and his staff.

3. In the matter of agricultural education, the Government observe that there was a considerable fall in the number of applications for admission to the three-year degree course at the college. The two-year certificate course has now come to an end, but the University have not as yet arrived at any conclusion as to the syllabus of the proposed Intermediate course which is to take its place. The two Agricultural Middle Schools established in 1922 at Taliparamba in Malabar and Anakāpalle in Vizagapatam failed to fulfil expectations; the number of entries shows a tendency to decrease and the proportion of students who have completed the full two years' course and returned to the cultivation of their own lands is small. The fundamental

difficulty appears to be that the average ryot can see the advantage of agricultural education for his son if it leads to an appointment in Government service, but as yet fails to appreciate the value of a sound practical training in modern methods of cultivation if his son is to do no more than apply the knowledge he has gained to the improvement of the family holding. The experience of other parts of India is the same; agricultural education qua education everywhere fails to appeal. The Government, however, do not consider that comparative failure over so short a period of time is a sufficient reason to discontinue the experiment. A system of agricultural education imparted through the medium of the vernacular for the benefit of genuine cultivators is sound in itself and though at present the idea may be in advance of public opinion, public opinion cannot be educated unless facilities for this type of education are provided. The Government therefore propose to continue the two existing schools and to open two more schools, one at Kālahasti in North Arcot and the other at a centre to be selected in the Tamil linguistic area.

4. Research work on the two principal crops, paddy and cotton, progressed on normal lines in spite of the unfavourable character of the season at many of the centres. Financial stringency prevented the expansion of the research staff and limited the investigation of new problems. In the Plant-breeding section, systematic work has only recently begun on cholam, ragi and other varieties of millets, no definite results have yet been obtained for groundnuts and other oilseeds, and nothing has been done for pulses of which red gram and Bengal gram are the most important. The need for additional staff to conduct investigations and additional stations to carry out experiments is urgent. In the Chemistry, Entomology and Mycology sections important problems connected with soils and manures remain to be solved, and plant diseases, fungoid, bacterial and physiological, have yet to be investigated. The reorganization and strengthening of these sections is under the consideration of the Government.

5. In the Livestock section the acquisition by the department of the Hosūr Remount Depot which comprises some 1,600 acres of excellent pasture and buildings sufficient to house nearly a thousand head of stock will enable investigations into problems of cattle-breeding and dairying to be conducted on a scale proportionate to their importance. Hosūr, working in close conjunction with Coimbatore, will deal with the local Kangayam breed of cattle, with the

improvement of milch cows by crossing strains imported from abroad and other parts of India, and with sheep breeding, pig breeding and poultry rearing, while the Chintaladevi and Guntūr farms will concentrate on the breeding of Ongole cattle and buffaloes, respectively.

6. The Government note with great satisfaction the valuable help given to the department by co-operative societies on the West Coast in combating the spread of plant disease. Palm disease, which in the last decade has caused the loss of many lakhs of palmyras in the Gōdāvari delta, continued to take a heavy toll of trees in spite of the efforts of the special staff which has recently been strengthened. The Government hope that the amendment of the Agricultural Pests and Diseases Act passed in the March session of the Legislative Council will be effective in checking the alarming increase of the insect pests to which Cambodia cotton is peculiarly liable. Experience in all the principal cotton growing countries has shown that the only practicable remedy is to uproot the plants on a fixed date and keep the land completely clear for a minimum period of two months. If September, the date provisionally fixed for the uprooting of cotton, is found to be too late to allow of a sufficiently long "dead season" an earlier date will have to be notified.

7. The demonstration work of the department consisted mainly in popularizing improved varieties of seed and in introducing economic methods of planting and better systems of manuring the land. The propagation of improved varieties of sugarcane on an adequate scale must await the opening of a cane-breeding station in the Vizagapatam district which, according to the present programme, will take place in 1926-27, but considerable success was obtained in introducing better appliances for the extraction of juice and the preparation of jaggery. As regards paddy, the principal crop of the Presidency, the system of economic planting, which both decreases the quantity of seed required and increases the yield per acre, and the system of fertilization of the land by the cultivation of green manure crops are so well established that the area to which these new methods are applied increases to a large extent automatically; figures from the different circles, however, indicate definite progress in almost all parts of the Presidency through the direct intervention of officers of the department. Work for the improvement of cotton, the second most important crop on the East Coast, proceeded on the usual lines and consisted mainly in the production and distribution

of good seed and in the demonstration of the advantages of drill cultivation. The efforts of the department to improve the quality of cotton in the three main cotton growing areas of the Presidency have so far been hampered and to some extent neutralized by the importation of inferior sorts for purposes of adulteration in ginneries and presses. The Cotton Transport Act, which has recently been made applicable to this Presidency, by restricting the movement of cotton in three protected areas, will lessen opportunities for the intentional or accidental admixture of seed and will assist the cultivator of Cambodia and other superior varieties of cotton to realize a better price for his produce.

8. The Government note with satisfaction the distinct advance in the sales of improved agricultural implements and the increase in the demand for spare parts which shows that the ploughs and other implements supplied in previous years have been found to be of real practical use. It is to be regretted that no research work has yet been attempted in this branch for want of staff and an adequate workshop.

9. A noteworthy feature of the year was the increasingly close liaison between the Agricultural and Co-operative departments. Apart from the purchase of seeds, manures and agricultural implements there are wide possibilities for the expansion of co-operative activities in joint production and joint marketing of produce. District Federations of Unions which are in course of organization in most districts will, it is hoped, take a real interest and play a definite part in agricultural propaganda work : through the medium of special sub-committees they are capable of performing most of the functions of District Agricultural Associations with better prospects of success than the present organizations whose failure is attributable to the fact that most of them are artificial creations containing comparatively few genuine agriculturists and have depended too much on official inspiration and support.

10. The programme of work outlined in the concluding section of the Director's report calls for no special comment. Consequent on the partial remission of the Provincial contribution it has been found possible to supplement the budget provision for agriculture amounting to approximately sixteen lakhs in the current year by the grant of another lakh and a half, which has been allotted mainly to the acquisition of land for additional agricultural stations in the Gôdâvari delta and in Malabar, to the expansion of the Livestock

section and to the strengthening of the district demonstration staff. The Government have, under consideration, further proposals for agricultural research and development, which, if financial conditions permit, will enable the department to expand its activities on a scale commensurate with their importance.

(By order of the Government, Ministry of Development)

G. T. H. BRACKEN,  
*Secretary to Government.*

To the Director of Agriculture.  
 „ the Chief Superintendent, Civil Veterinary department.  
 „ the Registrar of Co-operative Societies.  
 „ the Law (Education) department.  
 „ the Law (General) department.  
 „ the Public department.  
 „ the Accountant General.  
 „ the Agricultural Adviser to the Government of India (with C.L.).  
 „ the Government of India, Department of Education, etc. (with C.L.).  
 Editors' Table.

