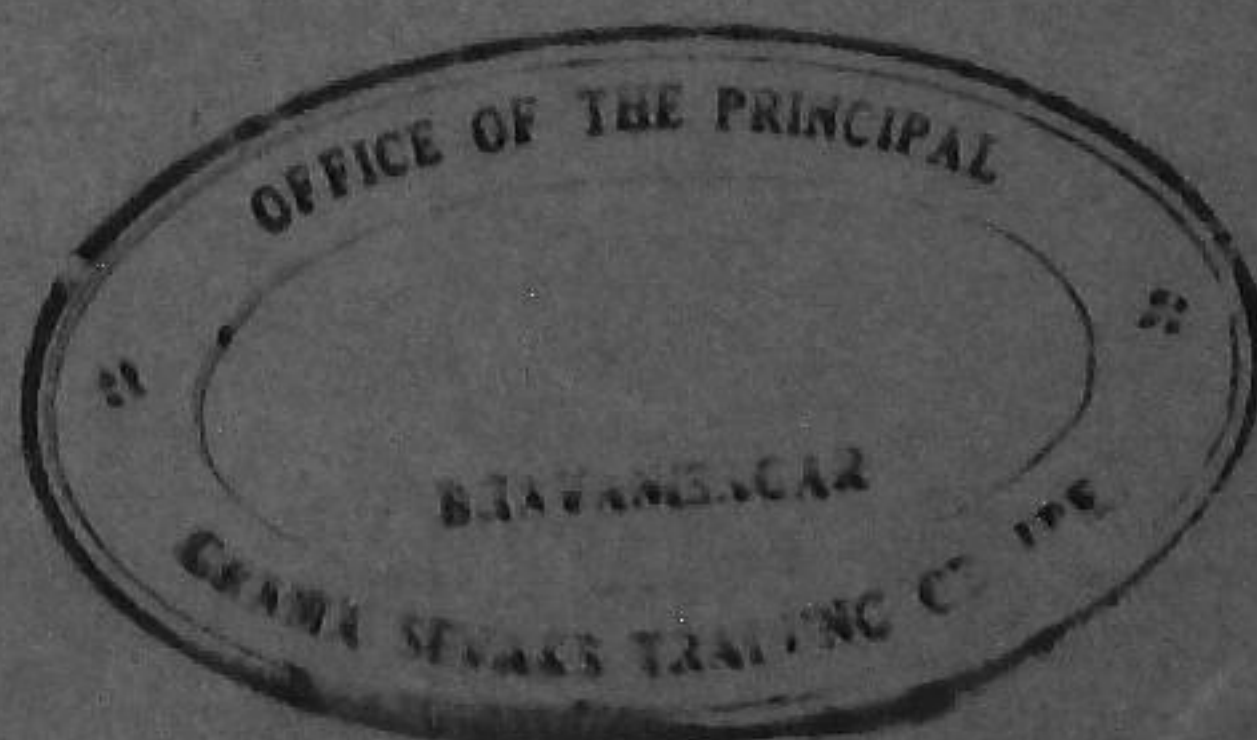


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GOVERNMENT OF MADRAS  
(FOOD AND AGRICULTURE DEPARTMENT)

POPULAR ACCOUNT OF WORK DONE  
AT AGRICULTURAL RESEARCH  
STATIONS AND RESULTS  
ACHIEVED DURING  
1949-50.



PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS,  
AT THE BRANCH PRESS, PUDUKKOTTAI.

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A. 148

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## PREFACE.

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There has been a long standing complaint that in this country the agricultural practices of the ordinary cultivator have not kept pace with agricultural research. It has to be admitted that although research work has advanced very far, the cultivator has been rather slow in taking up the results of such work.

That the Agricultural Department has not been able to do more and show better results is due mainly to the fact that there still exists a gap between research and extension work. Several suggestions have been made on "How best to translate the results of research into general farming practices."

There is no doubt that publications like leaflets and bulletins, issued by the Department, continue to fulfill a useful object in disseminating knowledge about the work done by the Department.

Scientific journals wherein the scientific achievements of the Department, are regularly published are rather technical beyond the reach or even understanding of the ordinary cultivator.

In this short and popular Publication, an attempt is made to bring out the salient features of research work done by the Department in a manner easily understood and appreciated by the cultivator.

This publication contains (i) the Results achieved in research during 1949-50 and (ii) the programme of work for 1950-51 pertaining to (A) Crop breeding stations, where the work is limited to one important crop and (B) General agricultural stations, wherein all the important crops are handled and (C) College Farms, where students receive practical training in agriculture.

It will be found, from a perusal of this publication, that several new lines of work have been undertaken and some useful results achieved.

There can be no doubt that this publication will open up the eyes of the public to the valuable work done by the Department. It is hoped that some atleast of the practical achievements will be made use of by the cultivator in aid of the "Grow More Food Campaign".



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# A—CROP BREEDING STATIONS

## I. Paddy

PADDY BREEDING STATION, COIMBATORE.

(COIMBATORE DISTRICT.)

### Results achieved in research during 1949-50.

1. The selection work in varieties from Kurnool, Gudalur, Wynad and Ramanathapuram districts was continued. The strains already released were multiplied for distribution to primary Seed Farms. 38,000 lbs of nucleus seed was produced on the station for distribution to Primary Seed Farms.

2 *Hybridisation work*.—Blast resistance—The study of progenies for the evolution of short and medium duration blast resistant strains was in progress. C.O. 25 and C.O. 26 were already popular in the southern districts, where long duration strains are cultivated and have so far spread over 50,000 acres nearly.

The study of progenies of crosses made for useful characters as drought resistance, resistance to alkalinity, and deep water conditions, was continued and about 5,000 progenies of different durations were examined.

3. *Agronomic Experiments—Fundamental studies*.—(a) The treatment of seed with chemicals as acenaphthene, agrosan etc., showed increases of 5 to 10 per cent over the untreated seed. (b) Soaking seed in 10 per cent tribasic potassium phosphate resulted in increased yield of 10 per cent over the untreated seed.

### Programme of work for 1950-51.

1. *Improvement of local varieties of paddy by pure line selections*.—A nucleus of the seeds of the strains already released C.O. 1-25 will be maintained for distribution to primary seed farms. Selection work in varieties like Bangarutheegalu, Pudupatti samba, Gudalur, Wynad and Ramanathapuram varieties will be continued.

2. *Hybridisation for crop improvement*.—The evolution of short and medium duration blast resistant strains will receive special attention, as two strains C.O. 25 and C.O. 26 of long duration have already been released for general cultivation. The study of progenies of crosses made for special purposes and inducing drought resistance, resistance to alkalinity, flood resistance and combining long and bunched character of the ear heads will also be continued.

3. *Agronomic Experiments*.—The efficacy of different doses of phosphates with graded doses of leaf will be studied as well as the influence of groundnut cake on the milling quality of paddy.

4. *Fundamental studies*.—The study of the influence of (a) place, climate and irrigation water on the yield of paddy will be continued. (b) Inducing mutations in paddy by treatment of the seed with X-ray



colchicine, acenaphthene and benzene vapour will be continued. (c) The effect of soaking seed in solutions of different chemicals and hormones will be studied.

## AGRICULTURAL RESEARCH STATION, MARUTERU. (WEST GODAVARI DISTRICT.)

### Results achieved in research during 1949-50.

1. *Improvement of local varieties of paddy.*—The strains already released were multiplied for distribution. The improvement of local varieties of paddy of Krishna, Guntur and West Godavari districts, namely, Atragada, Prayaga, Cummasari was continued. Two strains MTU. 20 (Prayaga) for stagnant conditions and MTU. 21 (Punasa Basangi) for high level areas were released as strains during the year.

2. *Hybridisation.*—One promising high yielding strain in Nallarlu (Dalwa) was multiplied for distribution. The cultures of Akkullu were compared against MTU. 1. The cultures suitable for low lying areas were compared against MTU. 16 in Collair zone. Some of the Konamani cultures gave significantly higher yield than the standard. Fresh crosses were also effected between MTU. 3 early and two dalwa strains MTU. 9 and MTU. 15 to introduce the vigour of the former into the latter. Nallarlu culture was under yield trial in the East Godavari district.

3. *Agronomic Experiments.*—In the comprehensive manurial experiments the grain and straw yields were significant for doses of Phosphoric acid only in the first crop season. In the compost experiment, compost was found to be on par with farm yard manure but better than 'No Manure'. In the ultraphos trial, phosphates gave significantly higher yields than green leaf alone.

The fundamental research experiments on paddy to find out the influence of soil, climate, variety and manure on the yield of paddy was conducted.

### Programme of work for 1950-51.

1. *Improvement of local varieties by pure line selection.*—The strains already released will be multiplied for distribution. The cultures of Atragada, Prayaga and Gummasari will be given out for trial in ryots' lands in Krishna, Guntur and Godavari districts.

2. *Hybridisation.*—Study of progenies of crosses effected to isolate high yielding cosmopolitan strains of different duration will be taken up. The cultures of Kasipichodi, Akkulu, Konamani and Nallarlu will be studied.

3. *Agronomic Experiments*—Experiments with compost will be continued. Manuring of green manure crops with phosphates to note the effect on the succeeding crop of paddy will be continued.

The irrigation experiments with varying quantities of water during the different phases of crop growth will be continued.



RICE RESEARCH STATION, BUCHIREDDIPALEM.  
(NELLORE DISTRICT.)

Results achieved in research during 1949-50.

*Paddy improvement work.*

*Molakolukulu.*—Culture 2501 has done better than BCP 1 and 2. Further selections are under trial.

*Pishanam.*—Culture 1283 continued to be the best and in district trials has given 5 to 40 per cent increased yields over local as control. Selection work is continued.

*Sannavadulu.*—Culture 1435 has done well in the district trials along with drought resistant Molakolukulu culture 1834.

*Atragada.*—Culture 409 has been very promising in the farm and the districts and will be released as BCP 3.

*Masipishanam.*—One selection is promising among 15 tried during the year.

*Deep water paddy.*—Cultures 1075 and 1055 isolated from Tiruvaranga local deep water paddy are being multiplied for further trials.

*Iswarakora.*—Selection work was in progress to isolate improved strains.

Selection work was also started in short duration, paddy varieties grown in the districts.

*Paddy Hybridisation.*—Culture 6994/1 a cross progeny of Kamban Samba was promising in district trials. Studies were pursued with the cross progenies of BCP 2 x MKLU 1834, Co. 15 x Iswara kora, Iswarakora x Pishanam 1183.

*Paddy blast studies.*—As no blast disease appeared during the year there was no opportunity to make the proposed studies.

**Agronomic experiments.**

*Cultural trials.*—Dibbling sprouted seeds of paddy gave significantly higher yields than the transplanting and broadcasting systems.

*Manurial experiment.*—In the comprehensive manurial experiment lower doses of Nitrogen (30 lbs. and 60 lbs. nitrogen per acre) gave higher grain yields than the higher doses 90 lbs. and 120 lbs. nitrogen per acre. In the phosphatic manures trial and liming trials the results were not significant. Manuring paddy with groundnut cake has not affected the milling properties of the grain.

*Other crops.*—Groundnut (TMV-2) tried after paddy gave 526 lbs. of pods per acre. Co. 4 cotton tried after short duration paddy was found to be a late variety for the tract.

Several varieties of pulses, green manures, vegetables, and fodder crops were also grown for study. 16,113 lbs. of paddy seeds of improved strains were distributed.



### Programme of work for 1950-51.

The following items of work will be continued :—

1. Selection and hybridisation work for the production of improved strains in Molakolukulu, Pishanam, Sannavadlu, Atragada and Iswarakora.

2. Studies on the incidence of blast disease on paddy.

3. Manurial and cultural experiments with paddy.

4. Trials with other crops, viz., groundnut, cotton, pulses, fodders, and green manure crops, as subsidiary work.

### RICE RESEARCH STATION, TIRUR.

(CHINGLEPUT DISTRICT.)

### Results achieved in 1949-50.

Paddy strains suitable for Chingleput, North Arcot and Chittoor districts in Sornavari, Samba, and Navarai seasons were multiplied and distributed for primary seed farms. In pure line selection promising cultures 3816 and 3532 in the rainfed varieties Sembalai and Pisini respectively were multiplied on a large scale for taking them to district trial. Cultures 3816 (Sembalai) and 3532 (Pisini) recorded increased yields of 26.9 per cent and 29.8 per cent respectively over ryots bulk of the varieties. Culture 8907 (Yerrasannavadlu) which recorded 13.4 per cent over the ryots bulk was multiplied on a large scale for distribution and district trial.

Eight promising sornavari cultures were in observation plots in four surrounding villages and culture 2332 was found promising in respect of both yield and duration. In progenies of crosses, between kar duration varieties which are period bound and samba varieties which are season bound to evolve a short duration strain with fine quality rice, under trial in the sornavari and navarai seasons, three cultures were found promising. 140 progenies of crosses between GEB. 24 XT. 250 (wild paddy) were studied with special reference to drought resistance and 40 were carried over for further test.

From intervarietal trials it was found that Co. 3 and ASD. 5 among medium duration strains and Co. 12, Co. 19, Co. 26 and BCP. 2 among long duration strains were found suitable for the tract. From the fundamental studies conducted during sornavari and samba seasons it was found that for sornavari season, Co. 13 was the best for grain yield and ADT 9 for straw yield and for samba season Co. 19 was the best for grain yield and Co. 26 for straw yield. In the night soil compost experiment night soil compost was found to be better than farm yard manure when applied on equal nitrogen basis. In the experiment to find the relative merits of super and Ultraphos when applied on a basal dressing of green leaves it was found that super was better than Ultraphos and 30 lbs. P-205 was the optimum dose.

In the manurial experiment to assess the merits of superphosphate and bone meal when applied direct to the paddy crop without a basal dressing of green leaves super phosphate was found to be better than bone meal.



In the experiment conducted with Co. 13 and Co. 5 in the Sornavari and Samba seasons respectively to assess the relative merits of transplanting, broadcasting and dibbling; the findings were in favour of transplanting.

Quebradinho variety of perennial cotton was found to come up well and was multiplied and distributed.

### Programme of work for 1950-51.

Multiplication of paddy strains suitable for Chingleput, North Arcot and Chittoor districts for supply to primary seed farms; improvements of paddy varieties popular in Chingleput, North Arcot and Chittoor districts by pure line selection; evolution by hybridisation of a strain (i) that combines the duration of kar varieties with the quality rice of samba varieties (ii) that can stand alkalinity, (iii) that is drought resistant; (iv) that is blast resistant; are the items in the programme under paddy improvement. Finding the optimum age of seedlings and spacing in the sornavari season and finding a method of green manuring of the semi-dry area are the main cultural experiments in the programme. Assessing the relative merits of town refuse compost and farm yard manure; the effect of the application of phosphatic manures direct to paddy crop and indirectly through the green manure crop preceding paddy crop and fundamental research to assess the influence of climate and soil in yield of crops are the chief experiments in the programme of work.

### AGRICULTURAL RESEARCH STATION, ADUTHURAI. (TANJORE DISTRICT.)

#### Results achieved in research during 1949-50.

*Paddy*.—All the Aduthurai strains and a few popular strains from other stations were multiplied and a record quantity of 1,48,093 lbs of seed disposed of to primary seed farms as nucleus seed. A new strain ADT 23 selected from the popular coastal saline-resistant variety. Kullankar, was released for general distribution in the district.

Work on the evolution of new strains consisted of selection of promising pure lines of Sarapalli, Konakuruvai, Vadan Samba, Poona-samba, Kattaivellai, Kodivellai and Kaivarisamba for trials at the station and in the districts. Crosses were effected, using long and short terms strains as parents for various objects, as for inducing seed dormancy in Kuruvai, saline resistance, blast-resistance, non-lodging non-shattering of grain, adaptability to deep water conditions and rice quality.

Manurial trials proved that some proprietary fertilisers like Engrats and Hyperphosphate had no special value. A complex experiment proved that application of Nitrogen upto 60lbs. per acre, returned economic yields and that green leaf was the best organic dressing for the rice crop.

A new set of trials to find out the duty of water for the rice crop was started. That early varieties of irrigated and dry cottons can be successfully raised after harvest of samba paddy was proved by trials with a number of hybrids and varieties.



Trials on plant protection methods such as the control of rice mealy bug with various insecticides and scorching nursery bunds were continued. The field rat, probably the worst pest on paddy in the delta, was practically eliminated by various measures as baiting with zinc phosphide, bow trapping, digging out the burrows, cyno-gassing and chasing and killing the pest at nights during the off season. A total of 5,790 rats was destroyed and 1,103 ryots were supplied with zinc phosphide.

The All India Co-ordinated scheme of Crop Weather studies on paddy was continued in co-operation with the Indian Meteorological Department, Poona and a Crop Weather Observatory was set up.

2. Other crops cultivated were sugarcane, bananas, grams, fruit plants such as mangces, Pomelo, limes and lemons, sathugudi, sapota seedless grapes and Japanese cherry. Seed materials of these were distributed. Grafting in mangoes was done for the first time. All kinds of vegetables were raised mainly for seed. Over 275 lbs. of seeds and 120, 475 seedlings were disposed of. Several green manure crops and perennial fodder grasses were also grown and seed material was supplied.

3. *Livestock*.—A Sindhi milk herd was maintained with a Sindhi bull for stud purposes. Poultry work was continued and 1,786 hatch eggs were produced and distributed. A new type of fresh water fish Laboo fimbriatus, was introduced into the fish pond and 225 lbs. of fish was caught and sold. Bee hives were maintained for demonstration.

### Programme of work for 1950-51.

*Paddy*.—Multiplication of paddy seed will be continued and intensified. Cultures under yield tests will be studied both at the station and in the districts. New work on the selection from the flood resistant varieties, Tiruthuraipoondi Kar and Kattuvarnam will be started. The first generation of crosses effected in 1949-50 and F-2's of 1948-49 will be studied and fresh crosses undertaken. New manurial experiments such as trials with fused phosphate, Alphonon (radio-active soil stimulant) and trace element sprays will be taken up. New cultural trials in udu cropping, using Co. 25 and Co. 26 in place of *Ottadan*, and with difference in spacing, number of seedlings and manuring and trials on blast resistance, duty of water, control of *soorai* and stem borer will be taken up. Trials with cotton varieties irrigated and dry, after *samba* paddy will be continued.

### Other Crops.

Other crops, excepting sugarcane and bananas, which have been discontinued, will be intensively grown and poultry development, pisciculture and apiculture will be continued.

### RICE RESEARCH STATION, AMBASAMUDRAM. (TIRUNELVELI DISTRICT.)

### Results achieved in research during 1949-50.

*Seed Multiplication*.—During the year a total quantity of 40,492 lb of improved paddy seeds, comprising of ASD-1, ASD-2, ASD-3, ASD-4



ASD-5, ASD-6, ASD-7, Co. 12 and GEB 24, were produced for distribution to the primary seed farms.

*Paddy.*—Selection work in Thuyamalli, Avasarasamba Veedhividangan Kolavalai, Arikiravi and Varigarudan samba was continued. Selection work was started in Puluthipiratti, a medium duration second crop variety, reputed to come up very well under semi dry conditions,

*Hybridisation work.*—In the *Kar* season, the study of the hybrid population from the cross between ASD-1, and ASD-3, and the multiple crosses between the various short duration first crop varieties was continued. The cross between ASD-1, and ASD-3 was effected with the idea of combining the non-shedding nature of ASD-3 with the high yielding power of ASD-1 to get a non-shedding ASD-1 type. In the *Pishanam* season, the Kavunginpoothala—GEB. 24 natural cross progenies were studied.

*Introduction of exotic varieties.*—Trials conducted with an idea of introducing a few types from Cuttack and Coimbatore did not give favourable results. In the second crop season Co.25 was equal to that of Co.12 in duration and a week later than that of ASD-6, but was found to yield better than both these strains. Thus the possibility of successfully introducing Co.25 in the place of ASD-6 and Co.12 has been established.

*Manurial and cultural experiments.*—Five manurial and one cultural experiments were conducted and the following conclusions were drawn subject to further confirmation.

(1) The addition of lime at 1,500 lb per acre tends to increase the yield of paddy.

(2) A new form of phosphatic fertiliser (Hyper phosphate) introduced by Messrs. Louis Dreyfus & Co., is not better than super phosphate or bone meal, even though it contains more phosphoric acid;

(3) Generally palmyrah leaf is applied to alkaline lands for correcting salinity. When the same palmyrah leaf is applied to lands which are not alkaline, it has a manurial effect, though not as good as other forms of green leaves like Daincha and Sesbania;

(4) Super phosphate when applied alone is unable to increase the yield of paddy as much as ammonium sulphate or green leaf when applied alone.

(5) Superphosphate fares better when applied in combination with green leaf or ammonium sulphate.

(6) Combination of superphosphate and green leaf seems to be better than the combination of superphosphate and ammonium sulphate or ammonium sulphate and green leaf.

(7) The possibility of treating paddy seeds with fertilising chemicals (tribasic potassium phosphate) prior to sowing instead of applying fertilisers to the soil after sowing or planting is not bright and

(8) The soundness of the local practice of giving repeated dry ploughing to the paddy fields of this tract during the months of April and May was proved by the results got on the station in an experiment designed for that purpose.



*Trials with other crops.*—Attempts to grow gingelly and groundnut after the harvest of the *Pishanam* paddy crop, during the months of March to June were not encouraging.

### Programme of work for 1950-51.

*Paddy.*—Selection work in Thuyamalli, Avasarasamba, Veedhivadangan Kolavalai, Arikira, Varigarudan, Puluthipiratti, Seenaganne and Raikuruvai will be done.

Hybridisation with varieties in the *kar* and *Pishanam* seasons and study of Karinginpoothala GEB 24 cross progenies will be continued.

Trials with paddy varieties introduced from Cuttack will be continued.

The cultural and manurial experiments conducted in the previous year except that with phosphate, will be continued.

### AGRICULTURAL RESEARCH STATION, PATTAMBI. (MALABAR DISTRICT.)

#### Results achieved in research during 1949-50.

1. *Improvement of local varieties* of paddy by pure line selection. The strains already released were multiplied for distribution to primary seed farms. The work on short duration varieties Elapapoo chambu and Chenkayama was ready for release during the year.

2. *Hybridisation work.*—The evolution of a non-deteriorating Co. 3 type engaged attention. Progenies of cross between Co. 3. and PTB. 19 and PTB. 20 which do not deteriorate during the monsoon periods were studied and two cultures resembling Co. 3., in all agronomic characters and do not lose their viability during rainy months were fixed up for trial in ryots' lands.

The progenies of crosses made for improving the yield of West Coast varieties by suitable crosses with strains from elsewhere were studied but it was found that the local varieties were best suited to the locality.

3. *Agronomic Experiments.*—The experiment with different doses of lime 1,000, 2,000 and 3,000 lbs per acre, with and without greenleaf showed that application of 3,000 lbs. of lime gave an increase of 24 per cent over no lime. The experiment with different kinds of green leaf showed that *kolingi* leaf to be the best.

The experiment with early medium and aged seedlings showed medium age in the nursery to be preferable to early or late ones. the seed rate experiment with the broadcast crop showed 80 lbs of seed per acre was sufficient to give good yields under manured conditions.

4. *Miscellaneous.*—The experiment with alphanon, the radio active stimulant applied at 20 lbs per acre recorded an increase of 16 per cent of grain and 25 per cent of straw. Sea Island cotton trials gave encouraging result. Yields of 300 lbs. per acre of seed, cotton as inter crop in



coconut plantations were obtained. The staple length was 1.60 inches and the lint valued at Rs. 2,500 per candy was adjudged to spin 100—120's.

### Programme of work for 1950-51.

1. Improvement of local varieties of paddy by pure line selection. The strains already released will be multiplied for distribution of seed farms. The work on short duration varieties like Elapepoo champan, Valia champan, and varieties for the sandy and low lying areas of West Coast will be continued.

2. *Hybridisation for crop improvement.*—The crosses made for the evolution of non-deteriorating Co. 3 type and also the selections made for evolving high yielding short and medium second crop varieties will be studied.

3. *Agronomic experiments.*—The experiments with different doses of lime will be continued as also the trials with combined cattle manure and phosphate combined organic and inorganic Nitrogen, different kinds of leaves and alphonat. The compost experiments of *modan* lands will be repeated.

The seasonal sowings experiments and seed rate experiments will be continued.

4. *Other crops.*—Groundnut, and Gingelly will be sown in rotation with paddy. Ginger improvement work will be continued in pursuance of a scheme sanctioned by the Indian Council of Agricultural Research. The study of the selected plants of Sea-Island cotton for improvement in yield and ginning per cent and response as inter crop in coconut plantations will be continued.

### PADDY BREEDING STATION, MANGALORE.

[SOUTH KANARA DISTRICT.]

### Results achieved in research during 1949-50.

1. Improvement by pure line selection and single plant selections were made in Doddari and Kanwa. The cultures of Doddari were compared against PTB. 10. The cultures of Kayama, Mascathy, Athikraya, Gudduboliare were under trial on the station and in the district as well.

2. *Hybridisation for crop improvement.*—The progenies PTB. 9 x PTB 14 and PTB 14 x Keeripala were under observation. Some of the progenies of the cross PTB. 9 x and PTB. 13 proved better than the parents. The cultures of Kavunginpoothala cross progenies were non-deteriorating when compared to Co. 3. as regards germination but only one culture proved superior to Co. 3. in point of yield.

3. *Manurial experiments.* During the first crop season, the residual effect of the application of lime to the previous crop was observed. The plots were again manured during the second crop season.

The experiment with coffee husk and green leaf to supply 30 lbs. Nitrogen was carried out and it was found that green leaf was superior to coffee husk.

Trials with Sea Island cotton are promising.



### Programme of work for 1950-51.

1. Improvement of local varieties of paddy by pure line selection. The trial of cultures of Kayama, Mascathy, Kanwa, Gudduboliare, Athikraya, Uber minda, Mindala and Doddari will be continued.

2. The strains evolved at other stations will also be tried to test their suitability to South Kanara district.

3. *Improvement by hybridisation.*—The following progenies of crosses will be studied. The progenies of PTB. 9 × PTB. 13 will be studied to isolate a non-shedding Kayama. The progenies of PTB. 9 × PTB. 14 to improve the quality of strain PTB. 9 and PTB. 14 × Keeripala to introduce good bunching in PTB. 14 will be studied. Kavunginpoothala cross progenies to evolve a non deteriorating Co. 3, type will also be studied.

4. *Agronomic experiments.*—The experiments to find out the proper strain for broadcasting under late conditions will be continued. Trials with early, medium and late nurseries of second crop strains to find out the suitable strain for early and late sowings commonly practised in the district will also be laid out. The effect of lime with and without green leaf on the yield of paddy will also be studied.

## II. Millets.

### MILLETS' BREEDING STATION, COIMBATORE.

[COIMBATORE DISTRICT.]

#### Results achieved in research during 1949-50.

*Cholam.*—“As a result of hybridisation and selection, two high yielding culture of *Periamanjai cholam* and five of *Talaivarichan cholam* significantly superior to their respective standards, were isolated and they are undergoing further trials. In *Periamanjai cholam* a juicy stalked selection taken from a cross gave high yield of both grain and straw. In district trials, the unirrigated strain Co. 2 and Co. 3 were found suitable for Dharmapuri and Krishnagiri, while the *Sencholam* selections, A.S. 681 and A.S. 5414 were found suitable for Dharampuram. Among the irrigated *cholams*, seven selections in three varieties (*Sencholam*, *Chinnamanjal cholam* and *Vellai cholam* of Coimbatore) were far superior to their respective standards. District trials showed that strains, Co. 4, Co. 5, and Co. 9 for Tirumangalam and Melur and A.S. 7563, A.S. 7570 and A.S. 7578 for Periakulam and Dindugal 21,553 lbs. nucleus seeds of improved strains were distributed for seed farms in the districts.

*Cumbu.*—Apart from pure line selection for the isolation of improved strains work for the evolution of hybrid strains was also in progress. Two hybrids X-1 and X-2 reached the stage of distribution and 45,000 lbs of seeds were multiplied in seed farms and 41,000 lbs of seeds were distributed to cultivators. Fourteen new hybrids were under yield tests. In breeding work for the evolution of hybrid strains was also in progress and 96 inbred lines have been selfed and selected.

*Ragi.*—Four short duration selections and three of *Karumsuruttai ragi* were superior to their standards in yield trials and 10,000 lbs of seeds of improved strains were distributed.



*Tenai*.—Three high yielding selections of *tenai* were advanced to yield trial. In rust resistance studies S. I. 3756 gave the highest yield and was most resistant to the disease. From district trials, the strains Co. 1 Co. 2 and Co. 3 were found suitable for Omalur and Co. 1 and Co. 3 for Dharmapuri and 2,000 lbs of seeds were supplied to cultivators and for seed farms.

### Programme of work for 1950-51.

The following are the main items of work in the programme:—

1. Evolution of high yielding strains of millets through selection and hybridisation.
2. Evolution of improved varieties having better type of grain, bolder grain etc.
3. Evolution of types which give high yields of more palatable fodder.
4. Isolation of specific strains suited to specified tracts.
5. Evolution of strains resistant to pests and diseases.
6. Evolution of hybrid strains in *cumbu*.
7. Evolution of strains in *cholam* resistant to "striga."

### REGIONAL MILLET STATION, NARASAPATNAM.

[VISAKHAPATNAM DISTRICT.]

### Results achieved in research during 1949-50.

The work on millets has been just started at this newly opened research station. This station is intended to work on the major millets of this locality viz., ragi, ganti (*cumbu*) and jonna (*cholam*) and the benefits of work of this station will extend to the districts of Sriakulam, Visakhapatnam and East Godavari. The staff were engaged in an extensive survey of the millet growing area of the locality and got acquainted in all the details of the work. They also made extensive collection of the millets grown in the locality. 124 samples of ragi, 62 samples of ganti and 71 samples of jonna were collected and await trials in the newly opened station.

### Programme of work for the year 1950-51.

The evolution of high yielding strains of the following millets through selection and their yield studies to isolate the best strains and multiplication of their seed for distribution are programmed for 1950-51.

1. Ragi.
2. Ganti (*Cumbu*).
3. Jonna (*Cholam*).

### REGIONAL MILLET STATION, ONGOLE.

[GUNTUR DISTRICT.]

### Results achieved in research during 1949-50.

*Jonna (cholam)*.—The trial of cultures transferred from the Lam, Guntur has shown that these are not suited to the locality. 160 samples



of local *Pyrro Jonna* seeds were collected and sown from which 66 single plants were isolated for further study. About 5,000 lbs of seeds of G.I. and G-2 *Jonna* were grown and distributed during the year.

*Variga* (*Panivaragu*).—Out of the seven cultures of Coimbatore *Variga* tried during the year, none was found better than the local variety. From the 148 samples of *Variga* seeds collected from the locality and sown at the station, 137 single plants were taken for further trial.

*Maize*.—The trial of imported seeds of maize has shown that I. 306, a variety of American hybrid corn has given better yield than the local maize. Sixty samples of maize seeds from the locality were collected and sown from which eleven single plants were selected for further trial. Two types of maize M J-3 and M J-4 received from the Lam, Guntur were found to be better than the others and will be tried again in the coming season.

### Programme of work for 1950-51.

The evolution of high yielding strains of the following millets through selections and their yield studies to isolate the best strain and multiplication of their seed for distribution, are programmed for 1950-51.

1. *Jonna*.
2. *Variga*.
3. *Maize*.

### REGIONAL MILLET STATION, TIRUPPATHUR.

[NORTH ARCOT DISTRICT.]

### Results achieved in research during 1949-50.

*Cholam* : *Talaivirichan cholam* occupies the major area of the locality and is usually grown rainfed as a mixed crop with *cumbu*. A number of types evolved at Coimbatore were compared with local seed and two strains, A.S. 8008 and *cholam* Co. 2 gave very high yield compared with the local seed. In addition, a number of promising cultures were noticed and they await further trials. Forty seven samples were collected from the locality from which eight promising single plants were selected for further trial. *Cholam* Co. 1 a *Periamanjai cholam* strain of Coimbatore had a normal growth and further trials with this strain will be done in future.

*Cumbu*.—As a mixed crop with *Talaivirichan cholam*, *cumbu* is extensively grown. Strains from Coimbatore, Anakapalle and Koilpatti were tried against the local seed but none was found better. From the trials of the promising types received from other Research Stations, a number of promising types were noticed and they are awaiting further trials. Thirty six samples of seeds were collected from the locality from which 138 single plants were isolated for further study.

*Ragi*.—This millet is grown as a garden land crop. Four strains of Coimbatore and one from Koilpatti were tried and two strains *Ragi* Co. 1 of Coimbatore and K1. of Koilpatti were found to be too long in duration



and unsuited to the tract. Seventy-six samples of local *ragi* were collected and sown for the isolation of promising single plants.

*Samai and Varagu*.—Samples of the local varieties of these millets were collected and sown for the isolation of promising single plants.

### Programme of work for the year 1950-51.

The evolution of high yielding strains of the following millets through selection and their yield studies to isolate the best strains and multiplication of their seeds for distribution are programmed for 1950-51.

1. *Cholam*.
  - (a) *Talaivirichan Cholam*.
  - (b) Other fodder and grain varieties.
2. *Cumbu*.
3. *Ragi*.
  - (a) Rainfed.
  - (b) Irrigated.
4. *Varagu*.
5. *Samai*.

### REGIONAL MILLETS STATION, ARIYALUR.

[TIRUCHIRAPPALLI DISTRICT.]

### Results achieved in research during 1949-50.

*Cholam*.—Fifty-seven samples of *Makkattai cholam* were collected from the cultivators' fields from which 81 single plants were isolated. Sixty samples of seeds of *Venchamarai cholam* were collected from the cultivators' fields and grown on the Station. Eighty-three promising single plants were selected. The Coimbatore strain Co. 2 and Co. 3, A. S. 8008 and A. S. 8085 were tried along with the local variety, and A. S. 8008 and A. S. 8085 were found better than the cultivators' seed. *Cholam* Co. 1 (the *periamanjai cholam* strain) of Coimbatore was found promising and will be given further trials. In the *Irungu cholam* trials, A. S. 7081, a type isolated from a cross between *Irungu* and *Periamanjai* was found to be the best. Sixty-five samples of *Irungu cholam* collected from the locality were grown and 81 single plants were isolated for further trial. A. S. 681 a *sencholam* type from Coimbatore is found suitable and awaits further trials. Nineteen single plants were isolated from eight samples of *sencholam* seeds collected from the locality.

*Cumbu*.—The Coimbatore strains *cumbu* Co. 1, Co. 2, X-1 and X-2 were tried but they were found unsuitable. One hundred and two samples of *Arisi cumbu* and 70 samples of *Paladam cumbu* were collected and sown from which 92 single plants of *Arisi cumbu* (70-75 days) and 61 single plants in *Paladam cumbu* (100-110 days) were selected for further study.

*Ragi*.—*Ragi* is grown as a dryland crop from July to December. From the trials of types received from Palur and Coimbatore, it was found that R. 958 and *ragi* Co. 1, are the best. They await further trials. Seventy samples of local *ragi* were collected and sown from which 120 single plants were selected for further trials.



*Varagu*.—*Varagu* is grown on a large scale in this tract from August to December. The trial of samples received from Palur and Coimbatore has shown that four cultures were promising and require further trials.

### Programme of work for 1950-51.

Evolution of high yielding strains of the following millets\* through selection and the study of their yields and purity to isolate the best strain and multiplication of their seeds for distribution are programmed for 1950-51.

\* (1) *Cholam*.

(a) Manja Makkattai.

(b) Vellai Makkattai.

(c) Talaivirichan *cholam*.

(d) Irungu *cholam*.

(2) *Cumbu* (Arisi *cumbu* and Paladam *cumbu*.)

(3) *Ragi* and

(4) *Varagu*.

## III. Pulses.

### PULSES BREEDING STATION, COIMBATORE.

[COIMBATORE DISTRICT.]

#### Results achieved in research during 1949-50.

*Crops*.—(a) *Redgram*.—Culture No. 37 was superior to 31 cultures tested. Moreover, the performance of this culture 37 under ryots' conditions in the various southern districts of the State was also encouraging as the extra yield ranged from 10 to 52 per cent. The trials of short duration redgram from Tenkasi showed beyond doubt that the variety is period bound coming to maturity within  $4\frac{1}{2}$  months from the date of sowing. In addition, 725 single plants selected from the ryots' crops in Tanjore (Vallam area) and Ceded districts were grown, and 142 promising cultures were retained for further trials. Bulk crops of cultures 37, 1723 and 2,900 were raised and seed gathered for distribution.

(b) *Green-gram*.—Three cultures sown in yield trial were adversely affected by the failure of rains and the plants produced only a few pods each. Out of the 105 single plants grown, 15 cultures, which withstood the drought and produced fairly large number of pods, were retained for further trial. Culture No. 62 sown as a bulk crop in a small area in the month of October with the receipt of North East Monsoon rains grew well and gave good yield. A variety of green-gram (China Mung) obtained from Dharwar was grown in dryland late in the season. It was found to be very early and suitable for growing in wet land as an after paddy crop, and a few desirable single plants were selected from the variety.

(c) *Blackgram*.—Cultures 212 and 216 gave 59.7 per cent and 48.7 per cent higher yields respectively than the local variety. From the four district samples grown, 50 single plants were selected for further work.



(d) *Horsegram*.—Culture 35 gave significantly higher yield than control (D-B. 7.) The results of the trial of the 24 cultures of the second batch of selections were not conclusive. D-B 7 was grown as bulk crop and seed multiplied for distribution.

(e) *Bengalgram*.—Culture 94 was found to give higher yield than the rest. Culture No. 482 was grown as bulk crop and seed collected for distribution.

(f) *Cowpea*.—From the 32 district samples collected afresh, 200 single plants were selected for further work.

(g) *Lab-lab*.—In the field variety 32 samples collected from districts were grown and 360 single plants selected. 15 kitchen garden varieties were grown and seed gathered for distribution.

(h) *Soyabean*.—Twentysix varieties of soyabean were grown under irrigation in small areas and seeds gathered. The acclimatised black variety from Bangalore was found to be the best in growth and yield.

### Programme of work for 1950-51.

*The following work is programmed in the several pulses:—*

(a) *Redgram* yield trial of 142 cultures. Growing of 56 types for maintenance, multiplication of cultures 37, 1,723 and 2,900 and studies in the preparation of redgram dhal for the market.

(b) *Greengram*.—Yield trial of three cultures for the final year on the station, trial of ordinary dry-land greengram against Perennial Mung from Philippines under rainfed condition in the main season and multiplication of culture No. 62 for sending seed to districts for trial under ryots' conditions.

(c) *Blackgram*.—Yield trial of cultures 212 and 216 for the final year on the station, and growing of 50 single plants for further studies.

(d) *Horsegram*.—Yield trial of 24 cultures and multiplication of D-B. 7 for distribution.

(e) *Bengalgram*.—Yield trial of 22 cultures. Growing of 115 types for maintenance and multiplication of No. 482 for distribution.

(f) *Cowpea*.—Growing of 200 single plants in non-replicated rows for further study and selection. Multiplication of New-era and C. 419 (Vegetable variety) and C. 57 and C. 521 (Grain variety) for distribution.

(g) *Lab-lab*.—Yield trial of 2 cultures for the final year. Growing of 360 single plants for further study and selection. Multiplication of field varieties D. L. 173 and D. L. 231 and selected kitchen garden varieties for distribution.

(h) *Soyabean*.—Growing of 26 varieties of Soyabean and collecting seeds.

(i) *Exotic pulses*.—Trial of exotic pulses received from Indian Agricultural Research Institute, New Delhi.



## PULSES BREEDING SUB-STATION, VIZIANAGARAM.

[VISAKHAPATNAM DISTRICT.]

**Results achieved in research during 1949-50.**

1. *Crops*.—(a) *Redgram*.—Ten cultures retained for further work were grouped into two sets according to duration and tried for yield. In the long duration series, three cultures gave higher yields than local bulk while in the short duration series none of the cultures outyielded the control. 192 single plants, selected from the ryots' crops in the Circars in the previous season, were grown and studied and 100 cultures were retained for further trials.

(b) *Greengram*.—Seven cultures were tried for yield under dry land conditions in the main season. Culture No. 127 gave the highest yield and it was significantly better than the local variety.

(c) *Blackgram*.—Four cultures of the first batch of selections and six of the second batch were put under regular yield trials in two series. Culture No. 189 proved its superiority over local bulk for a second time by giving the highest yield.

(d) *Horsegram*.—Four cultures (buff grain) and 3 cultures (black seeds) were tested for yield in two sets against their respective locals. Among the black seeded cultures, No. 93 gave higher yield than the control. None of the buff seeded cultures yielded better than the control.

(e) *Agronomy*.—The mixed cropping experiment was continued on the same lines as in previous years. The results showed that a combination of redgram and *ragi* followed by horsegram gave the highest monetary return per acre.

**Programme of work for 1950-51.**

The following work in Pulses is programmed.

(a) *Redgram*.—Yield trial of cultures 72 (early) and 97 (late) against their respective local bulks in separate series. Growing of one hundred cultures of the second batch of selections for further study. Multiplication of cultures 72 and 97.

(b) *Greengram*.—Yield trial of culture 127 against local bulk. Trial of Perennial "*Mung*" from Philippines against No. 127. Multiplication of No. 127.

(c) *Blackgram*.—Yield trial of four cultures. Multiplication of No. 189 for sending seeds for trial in districts.

(d) *Horsegram*.—Yield trial of three buff seeded and one black seeded, cultures against their respective local bulks.

2. *Agronomy*.—(a) Trial of pulses as pure crops and as mixtures with cereals and oilseeds—15 treatments.

(b) Experiment on the associated growth of pulses and cereals (Government Agricultural Chemist's Experiment).

3. *Miscellaneous*.—Growing of perennial cotton varieties sent by the Cotton Specialist.



## PULSES BREEDING SUB-STATION, DHARMAPURI.

[SALEM DISTRICT.]

**Results achieved in research during 1949-50.**

1. *Crops*.—Four cultures in each of redgram, lab-lab and horsegram were grown in yield trial plots. Due to adverse seasonal conditions, the growth of the crops was very poor, resulting in very low yields and hence results were inconclusive. Four hundred single plants in redgram, selected from the ryots' crops in North Arcot and Salem districts were grown in row yield plots and 62 promising cultures were retained for further trials. Cultures 37 and 2900 (redgram) were grown as bulk crops and seed gathered. The mixed cropping experiment was laid for the fourth time as in the previous years, but the crops withered away due to drought.

**Programme of work for 1950-51.**

The following work is programmed in pulses.

(a) *Redgram*.—Yield trial of 63 cultures, multiplication of cultures 37 and 2900 for distribution.

(b) *Lab-lab*.—Yield trial of 2 cultures brought to the final stage of trial.

(c) *Horsegram*.—Yield trial of 3 cultures brought to the final stage of trial. Multiplication of D.B. 7 for distribution.

(d) *Agronomy*.—Trial of pulses as pure crops and as mixtures with cereals and oilseeds.

**IV. Oilseeds.**

## AGRICULTURAL RESEARCH STATION, TINDIVANAM.

[SOUTH ARCOT DISTRICT.]

**The results achieved in research during 1949-50.**

1. *Groundnut*.—(a) Selection work revealed that selection A.H. 4111 was better than TMV. 2. the improved bunch groundnut under distribution. In spreading varieties none of the selections was better than TMV. 1 under spread in the districts already.

Hybridisation work for evolving (a) a dormant bunch type (b) a white seeded strain (c) a type of A.H. 6481 with less duration and (d) a strain of TMV. 1 type with better shelling outturn.

(b) *Agronomic Experiments*.—The rotation, mixed cropping, (bunch and spreading types), and cultivation experiments did not give any conclusive results due to adverse seasonal conditions. In the manurial experiments, manuring with cattle manure gave increased yields as against no manure.

2. *Gingelly*.—*Summer season*.—Selection work was continued and one selection in replicated new tests was found promising.

The spacing trials indicate that a spacing of 9" by 9" was the best for the irrigated crop.



Seed multiplication of important varieties and selfed types was carried on.

Hybridisation work was continued for evolution of a white seeded type and for production of new economic forms.

*Cold weather season.*—The sowings failed due to prolonged drought conditions.

3. *Castor.*—Nine selections in preliminary yield trials were better than local. Further selection work, purity study, Hybridisation and selfing were carried on. Horticultural types evolved were multiplied for distribution.

### Programme of work for 1950-51.

1. *Groundnut.*—Selection work, hybridisation and seed multiplication of improved strains will be continued.

The manurial experiment for finding out the optimum dose of potash and phosphoric acid required for the groundnut crop will be continued for the 3rd year.

The preliminary cultivation experiments for the third year and groundnut cereal rotation experiment for the sixth and final year will be continued.

Harvesting and curing trials will be repeated a second time.

Soaking seeds in nutrients solutions of Potassium Phosphate before sowing will be studied.

2. *Gingelly.*—Selection work, hybridisation and seed multiplication of improved types, will be continued in both the summer and winter seasons.

Spacing trials in the irrigated crops will be conducted for the third year.

3. *Castor.*—Selection work, studies in purity, in breeding, hybridisation and seed multiplication of strains will be continued.

### AGRICULTURAL (COCONUT) RESEARCH STATIONS; NILESHWAR I (PILICODE), II AND III.

[SOUTH KANARA DISTRICT.]

### Results achieved in research during 1949-50.

The response of the poor surface planted coconut trees in the sandy soil to the application of  $4\frac{1}{2}$  lb. ammonium sulphate, 15 lb. of fish guano and  $13\frac{1}{2}$  lb. of groundnut cake was not marked. The experiment to find out the effect of digging or ploughing the coconut gardens to obtain proper yields was started with the object of finding out the correct depth to which the soil has to be ploughed or cultivated in a coconut garden. Burial of coconut husks and leaves in trenches between rows of coconut trees has been established as a very useful practice to get increased yields. Burying in shallow trenches (15 inches deep) is to be preferred as the labour required is less. Of the various green manure crops under trial, *Crotalaria striata* is found to be the best. The scheme for the seed multiplication of *Crotalaria striata* in eight taluks of west coast inaugurated in 1948-49 was continued. Study of the world varieties of the



coconut was continued. It was found that varieties Laccadive ordinary, Laccadive small, Andaman ordinary and Cochin China are promising. A study of seedlings obtained by self, natural and controlled crop pollination of trees belonging to different yield groups showed that selfed progenies and progenies of trees from low yield groups are the least vigorous. Combinations involving high female flower production, high yield and thick meat are promising. Progenies of tall (female) and dwarf (male) continued to give good yields. Young progenies of crosses between a few selected world variety palms are under observation. The optimum depth at which coconut seedlings are to be planted is found to be three feet. An experiment to find out the effect of pot watering in summer months on the yield of coconuts is in progress. The study of the inheritance of characters in the coconut was taken up. One of the characters taken up for study was colour of petiole. Over 11,000 selected coconut seedlings were distributed to the public during the period under report and over 53,000 seednuts under the comprehensive Coconut Nursery Scheme, collected from reputed seed centres in Malabar and South Kanara were planted in the nursery.

The incidence of rhinoceros beetle attack is maximum during the summer months of March to June and minimum in September—October. The world varieties are found to be more susceptible to the attack than the State varieties.

Among the different crops tried as subsidiary crops in the shades of the coconut, tapioca and elephant yam were the most remunerative crops. Thin Napier grass was found by trial to be a better yielder of green fodder than Guinea grass and Napier grass. The improvement work on cucumber and Colocasia was continued with the object of selecting high yielding superior varieties. The local variety of Redgram gave higher yield than the short duration Tenkasi variety. Sea Island cotton comes up better than perennial cotton in the tract.

### Programme of work for 1950-51.

*Manurial experiments on adult coconut trees will be designed.*—(a) To find out the best nitrogenous manures for sandy soils in addition to regular cultivation.

(b) To find out the best method of applying manures in gravelly laterite soils.

2. *Cultural experiments.*—(a) To find out the effect of digging versus ploughing the coconut gardens.

(b) To find out the correct depth to which the soil has to be ploughed or cultivated in a coconut garden.

3. *Increasing the humus content of soil.*—To find out the proper depth of burying husks and to try newly introduced green manure crops.

4. Trial of subsidiary crops.

5. *Trial of coconut varieties suited for cultivation in low lying areas.*

6. *Coconut breeding.*—Comparative study of self, natural and cross pollinated seedlings of six yield groups, cyclic crosses, inter-varietal crosses etc.



7. Depth of planting experiment for finding out the proper depth of planting in sandy soil.

8. Copra and oil studies of nuts from Tall X Dwarf progeny palms.

9. Watering experiment of coconut trees.

10. Production of best selected seedlings for large scale distribution.

11. Study of the varieties of coconut.

12. Inheritance of characters in the coconut.

13. Spraying trial on adult coconut trees with insecticides against rhinoceros beetles.

14. Manurial experiment on cashewnut trees and morphological studies.

15. Trial of food and fodder crops in coconut gardens.

## V. Cotton.

### COTTON BREEDING STATION, COIMBATORE.

[COIMBATORE DISTRICT.]

#### Results achieved in research during 1949-50.

The items of research pertain to problems of yield maximisation, quality improvement and resistance to adverse environments, pests and diseases. In irrigated Winter Cambodia concurrent yield trials at Coimbatore and sub-stations Avanashi and Tiruchengode, brought out the superiority of five cosmopolitan selections among which 0734 was estimated to spin 52's as against 38's for Cambodia-2 and 45's for Madras Uganda-1. In small bulk yield tests at Coimbatore two selections 0752 and 8893 registered maximum lint length of 32-34 mm. equivalent to the best East African styles at the same yield level of Madras Uganda-1.

In the rainfed Cambodia trials six selections recorded good yields of seed cotton around 400 lbs. per acre in a droughty season and were superior to Karunganni control. Further breeding work in rainfed Cambodia suited for southern districts has been initiated at Periyakulam with the minimum objective of 15/16 " staple and 34 per cent ginning.

In the Karunganni breeding trials, two selections 7109/F-8/3 and 7125-12/3 were the best in lint length with 28-29 m.m. while re-selections from 7112-B maintained high values of 36-37 per cent ginning outturn. The superiority of promising selections over existing strain Karunganni-5 will be assessed in further tests.

In regional trials in cultivator's holdings the performance of 9030 in Cambodia tract and 7036-63 in Karunganni zone was encouraging.

Breeding for blackarm and jassid resistance was continued. The association of leaf hairness with jassid resistance was confirmed. The selection of biotypes for blackarm resistance under conditions of artificial inoculation of the bacterium was practised.

The work on wild cotton hybrids pointed to their utility for rainfed Cambodia tract and new regions like off-seasonal fallows in rice deltas.



Desirable types combining staple length and cropping capacity with resistance to adverse factors have been raised for effecting further selection.

Perennial cottons Moco and Quebradinho were found capable of spinning 50's and 24's respectively. Further trials in larger areas and study of new accessions of perennial cottons are under way.

With a view to fit in cotton after paddy in single crop wetlands in Tanjore delta, the study of the problem from the point of suitable varieties and selection of plants with short duration and good yield is being continued.

Study of inheritance of characters, vegetative propagation of cotton and germination and field performance of stored seeds are other items engaging attention.

The exchange of breeding material between the different cotton research stations in the State has become an annual feature of great value and the cotton breeding station plays a central role for such dissemination.

### **Programme of work for 1950-51.**

Breeding and selection work in irrigated Winter Cambodia, Rainfed Cambodia and Karunganni, Mungaris at Adoni, and Kakinada in Guntur, will be continued. Further selection in wild cotton hybrids will be done. Trials with perennial cottons Moco and Quebradinho and others will be carried out. Trials with cotton in rice fallows of Tanjore district to find out suitable short duration drought resisting high yielding types will be undertaken.

Studies in inheritance, vegetative propagation germination and field behaviour of stored seeds will be continued besides the supply of any breeding materials to other stations doing cotton research in the State

#### **SRIVILLIPUTHUR.**

In the trial of irrigated American for summer season six selections recording 32 m.m. length were isolated in advanced stage of breeding. The concurrent bulk trials of long staple hybrids will be conducted both at Palur and Srivilliputhur. In the regional trials with strain 7682 and Madras Uganda-1 in cultivator's holdings in South Arcot and Ramanathapuram districts the early habit of 7682 contributed to higher productivity as it withstood water scarcity in later stages.

#### **ADONI.**

Selections K-19 and K-21 were better than 881-F in bulk yield trials of Mungari cotton. Early re-selections from 'K' types maintained their staple length and high ginning values. Type G-4. M. 11 continue to be stenosis resistant and was utilised in hybridisation to impart resistance. Study of re-selections in breeding plots trials of promising types of cultivator's lands and maintenance and multiplication of 881-F are under way.

#### **NARASARAOPET AND GURZALA.**

In Cocanadas cotton, selection 336-B maintained its superiority over Cocanadas-1 in lint colour and ginning per cent. Among the other



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### **NARASARAOPET AND GURZALA.**

In Cocanadas cotton, selection 336-B maintained its superiority over Cocanadas-1 in lint colour and ginning per cent. Among the other



coloured types R.H. 25 was superior to 336-B in yield while being equal in other attributes. A wide range of hybrid material was studied with the object of isolating desirable lint colour-staple combinations.

Extra-State types 197-3 and 670-4 proved their utility for the *Chinnapathi* tract of Vishakapatnam district in comparative trials with Anakapalle white. Among the others K-21 combined both length and good ginning.

The items of breeding research will be continued by effecting further selection in hybrid material and resorting to fresh crosses and back crosses to create variability.

## VI Sugarcane.

### SUGARCANE RESEARCH STATION, ANAKAPALLE

[VISAKHAPATNAM DISTRICT.]

#### Results achieved in research during 1949-50.

*Sugarcane*.—Fifty-eight new varieties of cane were under study of which twenty-nine were found promising. In the yield trials, Co. 620 and 630 for early, Co. 624 and Co. 632 for midseason and Co. 615 and 617 for the late season, have been found to be promising. Under conditions liable for water-logging where the yield is generally low, Co. 419 has been found to be the heaviest yielder. Ratoon crops have been found to yield significantly less than the plant crop but by adding another 50 lb. Nitrogen over the normal manurial dose, which is 100 lb. of N. per acre, their yields can be significantly increased. Widening of the interval of irrigation that the normal ryots practice, did not affect the yield, thereby saving the cost of irrigation. Studies in Nitrogen nutrition of cane indicated that the maximum intake of nitrogen was over by August during the season and with the present manurial schedule, the nitrate status of the soil was not lowered at the time of harvest. It was found that Co. 527 and Co. 449 were less susceptible to smut than Co. 419. Treatment of setts with one per cent Bordeaux mixture and hot water at 56° C was effective against sett-borne infection of smut. Seed material from apparently healthy setts of smutted canes proved to carry over the disease to the next crop. Among the borers, *Argyria* caused not only dead hearts in the first four months of the crop but also continued to be an internode borer later, though to a smaller extent than *Diatreea*. Artificial releases of *Trichogramma* parasites were found to keep the early shoot borer under check by intense egg parasitisation.

*Paddy*.—Varietal and seed multiplication work was carried on. The experiment on the residual effect of continuous green manuring to paddy showed that the treated plots gave an increased yield of 10.8 per cent over the no manure plots. In the compost experiment with night soil compost and farm yard manure increased yields of 11.9 and 11 per cent respectively were obtained.

*Millet*s.—In ragi, selection A.R. 129 was found to be promising for the Punasa season.

*Fruits and Vegetables*.—Lucknow 49, Local Mirangi and smooth green varieties in guava, Pakala Oval and Guthi in sapota, Nepali Oblong



and Nepali Round in lemons were found to be good. In Banana variety, Karpura Chakrakoli was found to be the most resistant to Panama disease. Use of single stout bamboo for supporting and fixing it to the base of the bunch was found to be a more efficient and economical method than propping the plants with two bamboos as practised locally.

In vegetables, in the case of elephant yam twice the normal yield was obtained by using big size seed material i.e.  $\frac{3}{4}$ th size instead of  $\frac{1}{4}$ th size. Exotic vegetables were also cultivated and the yield of cabbage was 9,810 lbs. per acre. Dusting of gammexane was found to effectively control the cabbage caterpillar pest.

In all 1,402 grafts of mango and sapota and 1,340 layers and cuttings of Guava, grapevine, lemon and rose apple were made for supply to public.

*Poultry.*—5,133 eggs and 868 white leghorn chickens were produced for distribution.

### Programme of work for 1950-51.

1. *Sugarcane.*—The research work in sugarcane which is financed partly by the Indian Central Sugarcane Committee, will be continued as per programme drawn up in the sections of Agronomy, Chemistry, Physiology, Mycology and Entomology.

2. *Paddy.*—Varietal and seed multiplication work, experiments with green manuring under late planted conditions, and compost trials will be conducted.

3. *Fruits.*—Collection of fruit plants for trial, study of their performance, propagation of promising ones for distribution to the public will be continued.

4. *Poultry.*—Will be maintained for supply of eggs and chicks of the improved breeds, specially Leghorns.

## SUGARCANE RESEARCH STATION, GUDIYATHAM

[NORTH ARCOT DISTRICT.]

### Results achieved in research during 1949-50.

*Sugarcane Varieties.*—Fifty-seven new varieties received from the Indian Cane Breeding Station, Coimbatore and elsewhere were grown and the following were promising in yield and quality of juice Co. 635, 636, 638, 642, 643, 644, 646, 647, 650, Co. 652, 656, 673, 678, 680, 681, 682, 684 and 686.

In the yield trials of early varieties (those recording 16 per cent sucrose with over 85 per cent purity in December-January) Co. 636, Co. 643 and Co. 644 were on par with Co. 449 (Control.)

In the yield trials of late varieties (those that maintain 16 per cent sucrose with 85 per cent purity in April-May) Co. 467, Co. 471, Co. 475 and Co. 615 were found better than Co. 449 (the control).

*Agronomic Experiments.*—No differences in yield or quality of jaggery was found by the addition of 50 and 100 lbs. of phosphoric acid as manure to sugarcane (variety Co. 419) in combination with 200 and 250 lb. of nitrogen.



In the irrigation experiment with the Cane Varieties Co. 419 and 449, irrigations given at intervals of 6, 12 and 18 days did not produce significant differences between the treatments. Nor was the quality of jaggery affected by the different treatments.

### Programme of work for 1950-51.

Multiplication and study of new varieties received for the Indian Breeding station, Coimbatore, preliminary yield trials of the more promising types of new canes classified under early and late groups will be continued.

Manurial experiments with combination of phosphoric acid and Nitrogen on Sugarcane will be repeated for the third year for study on yield and quality of juice.

The Optimum water requirements of ratoon cane crops will be studied with special reference to frequency of irrigation at 6, 12 and 18 days intervals.

## VII. Potato.

AGRICULTURAL RESEARCH STATION, NANJANAD.

[THE NILGIRIS.]

### Results achieved in research during 1949-50.

*Potato.*—Forty four varieties were maintained. Varietal trials showed that Great Scot (imported from England 1947) gave the best yield among the early varieties and Kerr's Pink (England) gave the maximum yield among late varieties. Among the manurial trials, placement of Nanjanad mixture 3" below seed level gave the maximum yield. The complex manurial experiment indicated that it may be possible to reduce nitrogen from 85 lb. to 40 lb. and P-205 seems to be indispensable for the growth and yield of potatoes. Soil conservation experiments proved the superiority of contour planting to planting along the slope. Yield of potato and *samai* were more in the farm method than in the ryot's method. Mulching increases the yield of potato and reduces the cost of cultivation.

*Cereals.—Sample-A.*—A mass selection sample from the local *samai* was multiplied for distribution.

*Green Manures.*—Lupin seeds were multiplied for distribution in the district.

*Buck wheat trials.*—Buck wheat an introduced crop thrives well under local conditions. This is capable of yielding 400 lb. of grain that are edible when made into flour and baked. This makes a good cover crop against soil erosion and yields 25,000 lb. of green matter that can be incorporated into the soil to supply organic matter to the depleted soils of the Nilgiris district. The seeds are being multiplied for distribution.

### Programme of work for 1950-51.

Potato is the main crop of the station. A collection of 44 varieties is being maintained. In addition, trials with Indian Commercial varieties, Chilean Tuberosum varieties, Exotic Commercial varieties, Solanum



andigenum varieties, wild and cultivated species of South America and Simla Hybrids received last year from the Director, Central Potato Research Institute, Patna will be continued. Major varieties like Great Scot, Royal Kidney and Kerr's Pink which were imported in 1947 will be multiplied. Great Scot seed is to be multiplied on a large scale for distribution to the ryots of the district.

Experiments will be continued to find the best time for planting the main and second crop of potato, the best rotation for potato, the effect of liming the soil on the yield of potato and the possibility of reducing the N and P 205 content of the Nanjanad mixtue without affecting the yield and soil fertility. The effect of contour planting on the yield of potato will be further studied. The study on the loss of soil under different gradients in farm method, ryot's method and fallow plots will be continued.

Improved seeds of ragi and *Samai* will be multiplied for distribution in the district.

## VIII. Fruits.

FRUIT RESEARCH STATION, KODURU,  
(CUDDAPAH DISTRICT.)

### Results achieved in research during the year 1949-50.

The best performance in mangoes for the year was recorded with the varieties Phirangiludva, Rahimpasand, Khuddus, Swantham, Gundu, Panakalu, Cherukurasam, Shendria, Jehangir, Nazukpasand, Himayuddin, Chinnarasam, Alampur Baneshan and Baneshan. In Citrus, it was confirmed that the usual preference shown to aged seedlings for use as rootstocks was without any advantage in ensuring good tree performance. The wood apple rootstock for the Sathgudi orange was found useless for commercial orchards as it produces only stunted and weak trees. Among other rootstocks, Jamberi proved to be best, a single tree of Sathgudi on it, recording during the year a maximum yield of 1,026 fruits. Disease incidence in Citrus in the Vijayawada area was observed to be primarily dependent on the weather conditions, a dry and rainless period keeping newly planted trees free of disease even amidst old infected trees. Seven suspected budsports in Citrus possessing desirable features were located and propagated for a study of performance. In mango, 1,271 controlled pollinations were made out, of which ten fruits were eventually harvested and their stones sown for raising the cross-bred progenies. From earlier crosses planted for study of performance, sixteen fruited for the first time after planting of which four were promising in fruit quality. Spraying with Planofix, a proprietary product, was of some assistance in reducing the pre-harvest fruit drops in sweet oranges, acid limes and pomeloes. Damage by fruit sucking moth attack on Sathgudi orange trees was reduced by half with a spray of 0.1 per cent solution of DDT. 5,218 fruits were distributed from the Government Fruit Nursery during the year.

### Programme of work for 1950-51.

Maintenance of the variety collections and isolation of promising types and individual trees for propagation; conduct of rootstock trials for



Sathgudi orange, acid lime and lemon ; trials of topworking inferior seedlings with a view to convert them into superior fruiting forms ; rootstock trials with mango including a study of the performance of trees propagated by different methods and on polyembryonic rootstocks ; the study of flowering in the mango in relation to age and growth of shoots ; controlled pollination to evolve superior cross-bred forms ; miscellaneous propagation trials with fruits for which satisfactory methods are now not available and the propagation and supply of fruit plants to the maximum extent possible.

## FRUIT STATIONS, KALLAR AND BURLIAR.

(THE NILGIRIS.)

### Results achieved in research during 1949-50.

Of the rootstocks used for grafting mandarin orange at Kallar, Jamberi gave higher percentage of success than other stocks. Budding was comparatively less successful than grafting. Patch budding of the cacao recorded a maximum success of 80 per cent at Burliar in the months of June and August. It was found possible to propagate avocado through cinctured cuttings, by which method a success varying from 50 to 70 per cent was obtained in August and September operations. Of the banana varieties under trial at Kallar, Gros Michel proved very promising. In the rootstock trials of custard apple, the grafts on bull's heart registered better growth than either seedlings or grafts on their own seedling stock. Jack grafts raised on seedlings jack stocks recorded the maximum growth in the field during the year. Among the new introductions were two new varieties of avocado, one of fig and plants of Pejibave palm (*Bactris utilis*). 7707 plants of fruit, spice and other economic plants were distributed from the stations' nurseries during the year.

### Programme of work for 1950-51.

Maintenance of variety collections and isolation of promising varieties and individuals for future multiplication ; study of the performance of the several new introductions ; fresh propagation trials in mangosteen and such other crops for which no suitable method has so far been devised ; trial of new rootstocks for the several crops in order to determine the best stionic combination in each of them ; lay-out of fresh rootstock and progeny trials in mandarin, mangosteen jack, etc., for which plant materials have been assembled ; conduct of the rootstock and progeny trials already under way in Anonas and mandarin orange ; intensified production of plants of the several promising species for large scale distribution ; extension of the area under spices, drug and beverage crops.

## POMOLOGICAL STATION, COONOOR.

(THE NILGIRIS.)

### Results achieved in research during 1949-50.

Among the rootstocks for apple, all the Mertons except No. 793 proved promising in respect of sucker production, immunity to woolly aphid and tree vigour in the initial years of orchard life. The extended



trials with the dormant spray of 30 per cent linseed oil emulsion on apple trees once again resulted in earlier cropset and enhanced yields in Winterstein and Signe Tillisch. Drastic annual pruning of plum Gaviota and peach Killikrankie, resulted in depressed yields with no commensurate benefit in the vegetative vigour of the trees. Plum Hale, once again proved to be the best performer with a mean tree yield of 92lb as against the orchard average of about 30 lb. for this fruit. Besides Hale, another variety from Kotagiri was found to exercise similar pollinising effects on self-infertile varieties. The yield of Shiro trees in the vicinity of Hale recorded a mean tree yield of nearly 50 per cent more than those farther away, thus bringing out the effectiveness of good pollinisers such as Hale for promising fruit set. The precocious yields obtained by topworking the shybearing China pear with the prolific keiffer pear indicated the possibility of converting unthrifty trees into superior bearing forms by this means. The initial growth in the field of two peach varieties Red Shanghai and Shanghai Seedling, budded on three differently aged rootstocks of common peach indicated that the younger rootstocks imparted greater vigour to the scions in the initial stages of orchard life. The yields from cordon trained peach trees compared very favourably with those of the ordinary trees. Where space is limited as in home gardens this method of training and growing of peach trees appears to be promising. Seeds of a new species of *Diospyros* of possible rootstock value for persimmon were obtained from U.S.A. for trial under local conditions. 9,372 fruit and other plants were distributed from the station's nurseries during the year.

### Programme of work for 1950-51.

Performance study of the new introductions with a view to isolate promising ones for future extension; large scale multiplication and distribution of the several varieties and strains already adjudged to be worthy of extension; conduct of the rootstock trials already under way in apple, plum and peach; continuance of pruning and training trials in order to finally determine optimum methods for each variety; extension of linseed oil spraying trials to pears and persimmons in view of the encouraging results obtained in apples; studies on pollinising effect of Kotagiri plum of self-infertile varieties such as Shiro through topworking technique; propagation trials in persimmon through inarching on different stocks; maintenance of the variety collections and the newly planted Model Orchard cum Nursery.

### CENTRAL BANANA RESEARCH STATION, ADUTHURAI. (TANJORE DISTRICT.)

#### Results achieved in research during 1949-50.

During the year 65 banana varieties from various places in South India, West Bengal, Mysore State and Uttar Pradesh were collected and included in the varietal collection. The up-to-date total number of varieties under study is 128. Field trials to determine the best type of suckers for planting, separation of suckers and its effect on direction of bunching, optimum season for planting under Aduthurai conditions, the effect of mattocking on yield of the daughter sucker and the best method of desuckering were initiated during the year.

605 suckers of banana varieties were supplied to the public.



### Programme of work 1950-51.

Collection of varieties, the study of their morphological characters, their classifications and grouping of synonyms will be undertaken. Preliminary studies in hybridisation work will be taken up to discern compatible varieties with a view to build up economic characters later.

Preliminary trials to arrive at the optimum spacing, cultural operations and manurial requirements of perennial bananas as well as ratooning and manurial trials of bananas raised under wetland conditions are also programmed.

## IX. Gardens and Parks.

### GOVERNMENT BOTANIC GARDENS, OOTACAMUND (THE NILGIRIS.)

#### Results achieved—1949-50.

Several varieties and kinds of vegetables, ornamental and economic plants, were introduced during the year and were under observation. Among the vegetables, the Russian variety of Peas and some French beans varieties, appeared outstanding and worthy of multiplication. Among ornamental plants, Rhyder's Alwoodil stock, Pocha's giant Pansies, 'Giliath' and 'Victoria' varieties of Antirrhinums from Watkins, England, double mixed Clarkias, Pink Pearl and white pearl variety of Lupins from Yates, Australia, proved very outstanding.

Among the introductions were corkwood, milk tree, clover varieties, crested wheat, grasses and legumes.

On the vegetative propagation side, in the inducing of rooting by plant hormones, results were not conclusive. The season of planting was the main important factor, the rainy season being better than the rest.

Germination trials with flower seeds of annuals from different firms showed disparity in germination percentages, emphasizing the importance of the sources for obtaining seeds. Forcing trials on annuals with different manurial treatments showed that ammonium sulphate was superior to the rest. In the preliminary trials with soil-less culture, *Coreopsis* and *Petunia* showed vigorous and healthy growth.

Floricultural records of annuals were started and data recorded. Oil from different *Eucalyptus* varieties was distilled. Listing of medicinal plants and collecting of wild flora was done.

#### Programme of work for 1950-51.

1. *Rooting trials of Camellia Japonica, Azalea Indica and briar roses cuttings.*—Plant hormone Seradix 'B' for inducing better rooting will be tried.

2. *Growth of flowering performance records.*—Systematic recording of data of annuals, from sowing to final stage of the plant will be done.

3. *Growth, flowering, performance of all varieties of trees and shrubs.*—Height, girth, spread, month of flowering, colour of flower, month of seeding, etc., will be recorded for all the species in the garden.



4. *Studies of Eucalyptus species*.—A key to the identification of the several species will be prepared. Also extraction of oil and by-products, with qualitative and quantitative data as far as possible will be recorded.

5. *Collection of hill flora and medicinal plants*.—A collection of indigenous flora and medicinal plants of the Nilgiris will be taken up and a separate block established.

6. *Plant introduction*.—With a view to increase the plant collection, further introduction of ornamental and economic trees, shrubs, grasses, etc., will be taken up.

7. *Soil-less culture*.—Attempts will be made to grow vegetables and annual flowering plants and also develop the method for certain nutritional studies.

8. *Forcing trials*.—Trials on annuals will be conducted with different manurial treatments and their responses studied.

9. *Introduction and trial of temperate vegetables*.—Seeds of new varieties will be introduced and their performances studied.

10. *Production of seed-less tomatoes*.—By treatment with plant hormones, will be taken up and various changes studied.

### SIM'S PARK, COONOOR. (THE NILGIRIS.)

#### Results achieved in research during 1949-50.

In the monthly planting trials of briar rose cuttings, with and without application of hormone products, the months of July, October and November have given, consistently, a success of 100 per cent, 100 per cent and 90 per cent respectively, in rooting, both in 1948-49 and 1949-50. In the monthly rose budding trials the maximum 'bud-take' of 95-100 per cent was obtained during October, November and May operations in 1949-50 and the results are consistent with those in 1948-49.

Trials with budding of several *Eucalyptus* species on *Eucalyptus globulus* rootstock, inarching of *Camellia Japonica*, on Tea plants as rootstock, leaf propagation trials in *Begonia*, *Semper florenxs*, and *Rhododendron arboreum*, patch budding in roses, propagation of *Callistemon lanceolatus* by cuttings were lines of useful activities during the year.

Among successful introductions of ornamental plants, were several varieties of *Caladiums*, Day Queen, *Plumbago* white, and eight new varieties of *Hibiscus*.

Floricultural records on annual flower plants were maintained and valuable information for future designs, patterns, etc., was collected.

#### Programme of work for 1950-51.

1. *Propagation trials and plant hormones*.—(a) Monthly rooting trials of Rose briar, *Camellia Japonica* cutting with Seradix 'B.'



(b) Monthly rooting trial of *Camellia Japonica*, *Azalea indica* and Camphor cuttings with hertonome 'A.'

(c) Monthly budding trials of superior English roses on wild briar stocks.

2. *Growth and flowering performance of annuals.*—Systematic recording of data of annuals from sowing to final stage of the plant will be done.

3. *Growth and flowering—performance of trees and shrubs.*—Height, girth, spread, month of flowering, colour of flower, month of seeding etc., will be recorded for all the species in the garden.

4. *Studies on Eucalyptus species.*—A key to the identification of the several species will be prepared. Also extraction of oil and by-products, with qualitative and quantitative data as far as possible will be recorded.

5. *Plant introduction work.*—With a view to increase the plant collection, further introduction of ornamental and economic trees, shrubs, grasses etc., will be taken up.

6. *Taxonomic studies in roses.*—There are in all 50 varieties of Superior Roses at present. A study of vegetative characters will be taken up to prepare a key of several varieties for identification when plants are not in flower.

## B-GENERAL AGRICULTURAL STATIONS.

THE ARAKU VALLEY FARM, ARAKU.  
(VISAKHAPATNAM DISTRICT.)

### Results achieved in research during 1949-50.

Research with improved seeds of paddy, millets, sugarcane and vegetables was continued. In paddy varietal trials, AKP-1 and AKP-2 have done consistently well. Mass selected bulk in Ninnidhan, a local variety, has been found to be a heavy yielder. None of the strains tried were found to be better than the local battadhan under rainfed conditions.

In *Ragi*, AKP-7 and local Jagarlamandya were found to be heavier yielders. Mass selection in Jagarlamandya and Mudaimuscal is being done.

Mass selection work was carried on in *samai* and *jonna*.

In sugarcane trials Co.419 was found to grow well and better than Co.527.

Among the fruit plants, promising varieties of guavas, lemons, pine apples, Cape gooseberry, passion fruit and tree tomato, are being propagated for distribution to the hillmen and colonists. Sirumalai and Amratapani varieties of bananas have done well under rainfed conditions.

Soyabeans, perennial cottons, potato, and sweet potato were also under trial. Groundnut trials indicate promising results.

Exotic vegetables as cabbage, cauliflower, knolkhol, French beans have done well.



Among the indigenous vegetables, brinjals, snakegourd and batchali (green) have yielded well.

### Programme of work for 1950-51.

Introduction and trial of improved strains for the plains in paddy *ragi*, *jonna*, *samai* and mass selection in local varieties in these crops will be continued.

Trials with groundnut, buck wheat, gogu, soyabeans, perennial cottons, sweet potato and potato will be continued.

Cultivation of vegetables—exotic and indigenous—both supply of seeds and vegetables to the colonists will be done.

In the orchard, more fruit plants will be introduced for trial and in the existing ones, performance studies will be made. Promising fruit plants and economic trees will be multiplied for distribution to the hillmen. The poultry, dairy and sheep units will be continued to be maintained for the use of the colonists.

### AGRICULTURAL RESEARCH STATION, SAMALKOT. (EAST GODAVARI DISTRICT.)

#### Results achieved in research during 1949-50.

Research work on dry paddy revealed that Budama Culture No. 130 and Jilama culture No. 459 are superior to MTU 17 (Kodibudama) and MTU 18 (Kodi Jilama) respectively. In wet paddy, Basangi culture No. 262 scored over both SLO-9 (Rasangi) and MFU 3 (Pottibasangi). Comparative yield trials of the various strains grown in the tract indicate that the long duration strains MTU 19 Sannakusuma and SLO 18 Peddakicheli for the main season (Sarva) and SLO 12 Tellagarikasannavari and MTU 15 Dalwa Sannam for the second crop are superior to other strains.

Proddatur variety of turmeric was found to be superior to others and single plant selection No. 40 is promising. *Sesbania speciosa* and *daincha* were transplanted in field near bunds in standing water for seed multiplication and the trial proved successful. *Daincha* came to harvest a month ahead of *Sesbania*. Bellary glumed wheat gave acre yields of 607 lb. and 800 lb. when grown as broadcast and transplanted crops respectively.

### Programme of work for 1950-51.

Research work on dry paddy will be continued in Budama and Jilama varieties and Budama culture No. 130 and Jilama culture 459 will be multiplied. Work on wet paddy will consist of the following items.

Seed multiplication on a large scale of Rasangi culture No. 262, Atragada culture 10,776 and 24 promising cross progenies of Maruteru crosses for trials in the districts and the strains issued by the station.

2. Study and evolution of strains in Akkullu, Konamani, Basangi, Krishnakatakulu and long duration strains to fix high yielding strains suitable for normal wet condition for growing under deep water condition and in saline tracts and for the intermediate and second crop season.



3. Study of the influence of weather on the growth, yield and incidence of pests and diseases on paddy and sugarcane.

4. Work on bananas will consist of the maintenance of varieties and trials with night soil compost for comparison with farm yard manure. Turmeric varieties will be compared with local and the differences of the crops raised from round and finger corms will be studied. Trial of *Crotalaria striata* to find its suitability to wet lands, evolution of high yielding strains of black gram and green gram suitable to the tract, growing of fodder grasses for supplying slips to the ryots and maintenance of Rhode Island Red Breed of poultry for the supply of eggs, will be done.

## AGRICULTURAL RESEARCH STATION, LAM.

(GUNTUR DISTRICT.)

### The results achieved in research during 1949-50.

#### I. *Chilli*—Improvement work.

Research work on chillies under a scheme financed partly by the Indian Council of Agricultural Research was initiated during the year. Selection 2,150 from a Ceylonese variety gave 50 per cent increased yield over G-I, the strain under distribution. But it was found to be defective in pungency. The North Indian varieties were generally more tolerant to thrips attack and are more vigorous but possess less pungency in their fruits. Transplanting chillies 5" to 6" within rows spaced 22" apart was found to give 40-45 per cent more yield than the local method of spacing 22" apart either way.

2. *Coriander*.—Studies with coriander varieties of the State indicated that the Ongole variety was the best while that from Cuddapah was the earliest. The varieties from Tamil Nad were in general late and of these Koilpatti strain 131 was the best.

3. *Other crops*.—Selfed seeds of H.S. 9 Virginia tobacco (15 lb.) and G.1. Cotton were produced (99 lb. kapas). Among the perennial cottons—Meco was outstanding in yield. In sorghums G-3 failed but G-1, G-2 and G-4 gave 297, 170 and 254 lbs. grain respectively. Dry paddy varieties MTU 17 and 18 gave 1,094 and 1,629 lb. respectively due to a very favourable season. In the cotton-groundnut mixture trials, the yield of ground-nut was the same in the pure and mixed croppings, but the yield of cotton was affected by adverse weather conditions.

4. *Orchard*.—Cherukuram and Chinnaswarnarekha (Mango varieties) did very well in growth and yield. Among the citrus, Batavians yielded well.

### Programme of work for 1950-51.

Breeding work in chillies for evolution of a high yielding thrips-resistant variety or strain will form the main work on the station.

Evolution of a better yielding coriander, maintenance of purity of H.S. 9 Tobacco, G.1. Cotton and G-1 to G-4 millets strains, cultural and manurial experiments on chillies will be conducted.

In the orchard, collection of promising fruit plants, study of their performance and propagation of promising fruit plants, will be continued.



AGRICULTURAL RESEARCH STATION, NANDYAL.  
(KURNOOL DISTRICT.)

**Results achieved in research during 1949-50.**

Crop Improvement work.—

*Millets.*—Mungari patcha jonna selection work was in progress. In district trials NJ 6, 16, and 20 were promising at Dhone while NJ 6 and 20 were found good at Adoni. Among the pithy stem selections, NJ 1075 is very promising. In the Juicy stem selections, none was outstanding. In *Gundu patcha jonna* cultures N2 and N7 are very popular, and seeds for seed farm were supplied.

*Striga resistant types.*—Cross progenies of N1 and T6 with AS 4003 (Bonganhelo) a South African type resistant to striga were under study.

*Korra.*—Coimbatore strains were found unsuitable for this tract.

*Cotton.*—In the cotton breeding work in Northern, high ginning value of 33 per cent as compared to 24 per cent of N 14, was reached in some selections. The new hybrid selection 6202 E, was found to combine good lint quality and yield and has done well in regional trials.

In unirrigated American cotton trials MA II and HA 11 were found to be better than others for the black soils of the ceded districts.

Moco among the perennial cottons is promising. Groundnuts TMV 2 and 3 tried were found suitable.

*Agronomic trials.*—Groundnut and Indigo were found to be better as previous crops to cotton than jonna or jonna indigo mixture. Application of Nitrogen at 30lb per acre increases the yield but is not economical. Superphosphate has no effect on cotton. Patwa gogu, vegetables, cucumbers were under trial. Improved seeds of *Jonna* (12,290 lb) *Korra* (1,430 lb) paddy (6,535 lb) cotton (550 lb.) groundnut (760 lb) were distributed.

**Programme of work for 1950-51.**

Crop improvement work through selection and hybridisation in *Jonna*, *korra* and cotton will be pursued for evolution of better strains. The Agronomic experiments in progress during 1949-50 will be continued.

AGRICULTURAL RESEARCH STATION, HAGARI.  
(BELLARY DISTRICT.)

**Results achieved in research during 1949-50.**

*Crop improvement.*—Breeding work in the three major crops of the tract viz., setaria, sorghum and cotton was continued. Two high yielding cultures of setaria H. K. 282 and 289 were under observation in the red soil taluks of Anantapur and Bellary districts. The performance of these cultures was very good and they have created a very good impression on the cultivators. In addition 132 cultures were



under study on the station of which 22 promising cultures were advanced to yield trials. Two cultures of sorghum J-718 and K-14 gave higher yields than the standard strains M-47-3 and H-1 respectively in the yield trials. Nineteen cultures, pure for all the desired visual characters, were isolated for further study from the hybrid progenies sown in the F-4 and F-6 generations. Seed multiplication plots of H-1 and Co 1 *ragi* strains were raised.

*Cotton*.—Hybrid selection 4136 which maintained its superiority over westerns 1 in staple length, was found to spin upto 34's as against 26's of western's 1. New selections having a maximum staple of 24 m m. and 41 ginning percentage were isolated.

Rainfed combodia trials in unirrigated black soils indicated the suitability of M. A. II for this tract.

*Agronomic experiments*.—Two long range experiments viz., (1) experiment to correlate rainfall with the yields of crops and (2) Rotation experiment, were in their 9th year of trial. Manurial trials with groundnut cake and superphosphate were in the 2nd year of the trial. It was found that application of groundnut cake was beneficial for both cotton and sorghum though the increases due to manuring were not significant. Application of superphosphate did not induce any earliness in maturity either in cotton or sorghum.

16,275 lb of millets seed of improved strains of sorghum, setaria and *ragi* were distributed during this season to the district work officers for raising primary seed farm areas. 2,500 lb. of pure westerns 1 cotton seed were supplied to the primary seed nucleus area in Guntakal.

### Programme of work for 1950-51.

#### *Crop improvement.*

*Setaria*.—All the promising cultures on hand will be tested in yield trials. Fresh material will be collected from the cultivators field for isolation of high yielding types. Two cultures HK 282 and HK 289 will be again under observation in the districts.

*Sorghum*.—Promising cultures from the hybrid material pure for desired visual characters will be tested in yield trials. High yielding cultures from the yield trials will be given to the districts for trial. Fresh material will be collected from the cultivators' fields to isolate high yielding types to replace the present standard strain H-1.

*Ragi*.—Seed multiplication of the standard strains, Co. 1 and H-1 will be continued.

*Cotton*.—Advanced generation Hybrid materials in yield tests and hybridisation to create variation will be continued.

Further tests with reselections and hybrid derivatives of M. A. 2, H. A. 11 and Parbhani American will be conducted.

*Agronomy*.—All the four agronomic experiments viz.,

- (1) Rainfall yield correlation experiment.
- (2) Rotation experiment.
- (3) Manurial trial with groundnut cake, and
- (4) Manurial trial with superphosphate will be continued.



In addition, another experiment to study the advantages of growing the three major crops, cotton, setaria and Sorghum in strips, will be initiated during 1950-51.

## IRRIGATION RESEARCH STATION, SIRUGUPPA. (BELLARY DISTRICT.)

### Results achieved in research during 1949-50.

A number of varieties of cultivated crops were tried for testing their suitability under irrigation in the blacksoils of Bellary district.

*Jonna*.—Of the several varieties of *jonna* tried Co. 9 gave the maximum yields in the short and long duration varietal trials.

*Ragi*.—Karumsuratti *ragi* gave the maximum yield.

*Paddy*.—G.E.B. 24 for growing in the early season (July-November) and Co. 13, Co. 20 and A.D.T. 18 for the late season (January-April) were found suitable.

*Redgram*.—Out of the 8 varieties tried, Warangal type was the best followed closely by H-10 with about 838 and 836 lb. grain per acre respectively.

*Groundnut*.—Among the bunch varieties H. 4111 gave the maximum yield of 2,014 lb. of pods followed closely by T.M.V. 2 with 2,000 lb. per acre of pods.

A.H. 4354 among the spreading varieties was found to yield best with a maximum area yield of 1,177 lb. of pods followed closely by T.M.V. 2 which gave about 1,125 lb. of pods per acre.

*Cotton*.—Of the six cotton types under trial H.A. 11 has proved to be the best with 825 lb. of kapas per acre. M.A. II is also promising. Two selections 2196-4 and 1821-2 maintained their consistency for blackarm and jassid resistance. The following rotation experiments were conducted for the second year and inference can be drawn only on completion of the experiment.

#### (a) Four course rotation.

1st year *Jonna*.

2nd year green manure followed  
by wheat.

3rd year cotton.

4th year groundnut and cotton  
mixture.

#### (b) Three course rotation.

1st year cotton.

2nd year *jonna*.

3rd year groundnut and red-  
gram mixture.

The physico-chemical investigations of the irrigated blacksoils, have confirmed the previous years findings that irrigation of the blacksoils does not give rise to alkalinity in the soils.

### Programme of work for 1950-51.

The trial of varieties of *Jonna*, *Ragi*, paddy, groundnut, and redgram for finding out varieties and types suitable for irrigated blacksoils will be continued. The breeding work in cotton for evolution of a suitable type for the tract will be pursued.

The 3 and 4 course rotation experiments will be continued.



## AGRICULTURAL RESEARCH STATION, PALUR.

(SOUTH ARCOT DISTRICT.)

**Results achieved in research during 1949-50.**

(i) *Paddy*.—Out of four selections of Sornawari paddy compared with SW. 7 the strain now distributed from the station, two selections Nos. 1235 and 1251 yielded 12 per cent more than the standard. Considering the results of the previous years' trials, No. 1251 was the better of the two, with an average increase in yield of 14 per cent and this has been selected for multiplication of seed and trial in the district. Out of five strains tested in the *navarai* season, Co. 13 the shortest in duration, yielded the highest this year. In an experiment in which dibbling sprouted seed was compared with broadcasting seed and transplanting seedlings, in different seasons it was observed, that the usual practice of transplanting seedlings, resulted in higher yields than the others. A manurial experiment with different doses of green manure conducted for the third year did not lead to conclusive results. In a series of experiments with manures cum varieties Paddy A.D.T. 9 yielded the highest in the *kar* season and Co. 26 in the *samba* season.

(ii) *Sugarcane*.—Fiftysix new types of cane received from Coimbatore were planted for multiplication of sets, and 45 new types were under study. Thirteen "early" and 21 "mid-season" types were compared for yield with Co. 281 and Co. 349 as the standards. Only two early types, Co. 620 and Co. 623, were promising. Two sets of manurial experiments, one with high doses of nitrogen alone, ranging from 250 to 500 lb. per acre, and another with a high dose of nitrogen (400 lb.) with different doses of phosphoric acid, were conducted for the second year. It was observed that the higher doses of nitrogen, above 250 lb. per acre, or the addition of phosphoric acid, did not result in increased yields. The quality of the cane was also not affected by the high doses of nitrogen or the application of phosphoric manure.

(iii) *Millets*.—*Ragi* selection R. 382 from a local variety evolved at the station, was tried in the cultivators' fields in the South Arcot district, and was reported to have yielded 7 per cent to 50 per cent more than the local in different villages. *Ragi* A.K.P. 1 a strain of the Anakapalle Agricultural Research Station, tested at this farm, was found to be suitable to the tract. It was shorter in duration than R. 382 by about a fortnight, but, yielded about the same quantity of grain. This strain was tested in cultivators' fields in the Chingleput and was reported to have yielded 8 to 18 per cent more than the local. Twenty-two selections of *ragi* consisting of 13 selections of the same duration as R. 382 and nine selections, about a fortnight shorter in duration, were compared in yield trials plots, in two seasons, May to September and December to March, for the third year. Only A.K.P. 1 yielded more grain than the standard in the May to September season. A *varagu* selection No. A 117, evolved at the station, was tried in cultivators' fields in the districts. It was reported to have yielded 7 to 50 per cent more than the local in the South Arcot district, 25 per cent more than the local in the Salem district, and 30 per cent more than the local at the Agricultural Research Station, Pattukottai, Tanjore district.

(iv) *Other crops*.—The manurial value of compost was compared with that of cattle manure to sugarcane, *cumbu* and *ragi*. In sugarcane



the average yield of cane from plots manured with cattle manure was 16 per cent more than that of the plots manured with compost. While in *cumbu* and *ragi* there was no difference in yield due to the two manures. Similar results were obtained on groundnut and sunhemp, grown after *cumbu* and *ragi* respectively, in the same plots without the application of the manures. It was observed in lucerne that the yield of fodder was not affected by different doses of borax applied. Trials of varieties of sweet potato, tapioca, banana and *vendai* (*Hibiscus esculentus*) were also in progress.

*Cotton*.—Research work with the irrigated American cotton in summer season, revealed six selections with 32 mm. staple length. In the district trials strain 7682 proved to be early with high productivity as it withstood water scarcity in later stages.

(v) *Miscellaneous*.—26,500 lb. of paddy seed, 2,785 lb. of *ragi* seed 136 lb. of vegetable seeds, 96,000 sugarcane sets and 34,700 fodder grass slips besides small quantities of seeds and plants of other crops such as *cumbu*, *varagu*, *groundnut*, redgram, sweet potato, fruit plants and green manure plants were distributed from the station.

### Programme of work for 1950-51.

*Paddy*.—Yield trials of selections suitable for each season, in the *kar*, *thaladi*, and *navarai* seasons. Manurial experiments to determine the optimum dose of ammonium sulphate and superphosphate, for the *kar* and *thaladi* seasons, and to study the effect of applying phosphatic manure to green manure crop preceding paddy in the *samba* seasons. Manurial cum varietal trial in the three seasons, in high level and low level fields, with different strains suitable for each season. Multiplication of seed of strains for distribution in the South Arcot and neighbouring districts.

*Millets*.—Yield trials of 22 selections of *ragi* in comparison with R. 382 and A.K.P. 1 in two seasons, May to September and December to March. Multiplication of seed of *ragi* strains.

*Other crops*.—Comparison of manurial value of compost with that of cattle manure on *cumbu* and *ragi*, followed by groundnut and sunhemp. Trial of cotton as a mixed crop with *ragi* and groundnut. Multiplication of seed of groundnut T.M.V. 4 redgram C. 37 and short duration redgram of Tenkasi. Varietal study and yield comparison of sweet potato, tapioca and *vendai* (*Hibiscus esculentus*.) Production of vegetable seeds, fruit seedlings, grafts, layers; study of the effect of application of borax on the yield of lucerne, a fodder crop will be undertaken. In cotton a number of hybrid derivatives of intra-Barbadense and interspecific crosses will be studied for evolution of a type suitable for cultivation as a summer crop.

### AGRICULTURAL RESEARCH STATION, PATTUKKOTTAI.

(TANJORE DISTRICT.)

### Results achieved in research during 1949-50.

*Paddy*.—In *Kuruvai* season varietal trials A.D.T. 9 seems to be the best but its duration appears to be a handicap for its extension.

In the *Samba* season Co. 19 was decidedly the best.



In the *thaladi* season, Co. 25 has fared well though in the previous years A.S.D. 5 was outstanding.

In the manurial experiments on *Kuruwai*, Nitrogen alone enhances the yield. In *Samba*, no difference was found between the different green leaf manures tried. There was no significant difference between dibbled and transplanted paddy.

*Sweet Potato*.—Among several varieties tried, Ranger an American type gave a very heavy yield of 15 tons per acre.

*Cotton*.—In order to use the rice lands during the fallow period in summer a number of American and *desi* cottons were grown after the harvest of paddy. Some cultures gave promising yields.

### Programme of work for 1950-51.

*Paddy*.—The varietal and manurial experiments will be continued.

*Sweet Potato*.—Varietal studies will be pursued.

*Cotton*.—Trial of cotton in rice fallows for finding out suitable varieties for rainfed and irrigated conditions will be pursued in an intensified manner.

## AGRICULTURAL RESEARCH STATION, KOILPATTI.

(TIRUNELVELI DISTRICT.)

### Results achieved in research during 1949-50.

1. *Agronomic experiments*.—The following six agronomic experiments namely (a) New Cultural Experiment, (b) New Rotation Experiment, (c) Indigo-cereal mixture experiment, (d) Cereal-indigo mixture experiment with super phosphate, (e) Cotton pulse mixed cropping experiment and (f) Boron experiment on cotton were laid out during the year 1949-50. As these are long term experiments, no definite conclusions could be arrived at, with this year's trials. However the following indications were noted.

(a) In the cultural experiment, medium depth of ploughing tended to increase the yield of cotton as compared to no ploughing operation but the increase was not noted in the case of *cumbu* and *irungu cholam* crops.

(b) In the rotation experiment the results achieved indicated that indigo as a mixed crop with *Irungu* or *cumbu* tended to increase the yield of the succeeding cotton crop without pulling down the yields of the mixed crop.

(c) The "*cholam* effect" is a depression in the yield experienced by the *cumbu* or cotton crops which follows an *irungu cholam* crop. To correct this "*cholam* effect" a mixed cropping of *irungu* and indigo is advocated. The cereal indigo mixture experiment has been laid out to find out the optimum seed rate and also the time of ploughing-in of the indigo crop. The results indicated that a 12 lb seed rate of indigo and early ploughing-in of the resultant indigo crop gave good results in correcting the "*cholam* effect".



(d) In the cereal indigo experiment with super phosphate, it was observed that the effect of Nitrogen is better felt in the presence of phosphoric acid.

(e) In the cotton pulse mixed cropping trials, the groundnut cotton mixture affected the yield of cotton the least and the cropping will be a success in case a high yielding groundnut type is isolated for the black soil conditions at Koilpatti.

(f) In the Boron experiment it was found that 10, 20, 30 and 40 lbs. borax per acre tended to give increased yields of cotton as compared to no boron, which was used as control. But the increase in yield was found to be not significant.

2. *Evolution of high yielding millet strains.*—A few high yielding economic selections in the millets crops mentioned above are being tested in the various stages of yield trials. Special mention must be made of A.S. 7081 the extracted type of the Irungu × Periamanjai *chulam* cross which has given very encouraging results and is likely to replace the Irungu crop of the tract.

3. *Cotton.*—Breeding work resulted in evolution of two strains 6435-2 and 6874 which yielded about 600 lb. of seed cotton with nearly one inch staple and 34–36 ginning percentage. Concurrent trials in Coimbatore district indicated that these strains were suitable here also.

### Programme of work for 1950-51.

The agronomic studies and breeding work in millets would be continued. The hybrid *chulam* strain A. B. 7081 would be studied as a grain crop and a fodder crop on the dry lands both on the farm and at various centres in the districts. Cotton breeding work for the evolution of a medium staple *desi* type capable of spinning 40's and suited for cultivation in the winter Karunganni tract will be continued.

### AGRICULTURAL RESEARCH STATION, TALIPARAMBA. (MALABAR DISTRICT.)

#### Results achieved in research during 1949-50.

Paddy strains P.T.B. 8, 9 and 13 were multiplied and distributed to the ryots of this region.

Sugarcane cultivation and manufacture of jaggery were demonstrated to the local ryots by growing two strains Co. 408 and Co. 419 on an area of 20 cents.

Trial of chillie varieties indicated that the South Malabar and South Kanara varieties are more suitable for this tract and 80,400 seedlings of these varieties were raised and distributed to ryots from whom there is an ever increasing demand for seedlings.

The great demand for fruit plants especially popular mango varieties, good jack varieties, sapota, Malta lemon, Mangosteen, cashew, bananas, and pineapple varieties was met during the year by distributing grafts, layers, seedlings, cuttings and seeds of these fruit trees. A total of 86,211 plants of all the above were distributed. 3,430 seedlings of



selected South Kanara, Malayan and local varieties of arecanut were raised at this station and distributed to growers.

Vegetables like brinjals, cucumbers, gourds, pumpkin and amaranthus were grown over nearly two acres and 75 lb. of seeds were collected for distribution to growers. Brinjal again was one of the most popular vegetables grown and 11,700 seedlings of this were raised and distributed for growing as rainfed crop in the tract.

Some Travancore varieties of pepper again appeared to be more hardy and drought resistant than the local varieties.

### **Programme of work for 1950-51.**

All the above items of work except that on sugarcane, will be continued.

Some more chillie varieties, especially, strains evolved at the Lam Farm, Guntur will be tried.

Trials will be conducted with a number of good tapioca and sweet-potato (root crop) varieties as a measure of encouraging subsidiary food crops.

## **AGRICULTURAL RESEARCH STATION, AMBALAVAYAL**

(WYNAAD COLONISATION SCHEME.)

(MALABAR DISTRICT.)

### **Results achieved in research during 1949-50.**

*Paddy.*—Sixteen pure lime cultures in six local varieties viz., Palthondi, Marathondi, Velumpala, Chettuvalian, Maranelly and Kithandan have been selected for final comparative yield trials. The trials on double cropping of wet land has established that two crops of paddy can be profitably raised in a year in the same plot, if irrigations facilities are available, instead of the local practice of raising only a single crop, irrespective of the availability of sufficient water for raising two crops. The system of raising a medium to long duration first crop and a short duration second crop has been found to be better than raising a short duration first crop and a long duration second crop as the former system has recorded an increased yield of about 1,000 lb., per acre over the latter system. The strains P.T.B. 10 MTU. 3 Co. 13, and varieties Palthondai and local Navara have been found suitable for growing in the second crop. The strains S.L.O. 17, S.L.O. 18, and M.T.U. 19, have been found suited for popularisation in Wynaad as these strains have recorded yields of over 3,000 lb. per acre.

*Other crops.*—It has been found that sugarcane can be grown profitably both in the dryland and wetland even under purely rainfed conditions. Crops like horsegram, redgram and cowpea have been found to be well suited for cultivation on an extensive scale in Wynaad. Vegetables like cucumber, bittergourd, snakegourd, ribbedgourd and amaranthus have been found to be suited for cultivation in high level wetlands during the summer season, while pumpkin, ash gourd and brinjal have been found to be suited for cultivation during the South West Monsoon season in the drylands.



*Fruits.*—The trials with different kinds and varieties of fruits has shown that Malta lemon, pineapples, passion fruit, and banana varieties Gros Michael, Mauritius, Pedda Pacha Arati, Chenkadali, Suganthi, Nen-dran, Mannan and Mysore Poovan are suited for extensive cultivation in Wynaad on account of the very satisfactory performance recorded by these.

The budding trial with Mandarin oranges has shown that it can be successfully propagated by budding on rough lemon seedlings and that the season from January to May is the optimum for the operation. A large scale nursery of Mandarin orange, Malta lemon, acid lime, passion fruit, jack, arecanut, coffee, silver oak and Eucalyptus has been raised for making these available for distribution.

### Programme of work for 1950-51.

The items of work proposed to be carried out during 1950-51 comprise the following :

1. Evolving high yielding strains of local paddy varieties.
2. Confirmatory trials on double cropping of wetland.
3. Trials on "Oodu" cultivation.
4. Trials to determine the strains and varieties best suited for planting in different months of the planting season from June to October.
5. Trials with different kinds and varieties of fruits to select the kinds suited for extensive cultivation in Wynaad.
6. Comparative trial of budded plants and seedlings of Mandarin orange.
7. Trials to determine the optimum cultural and manurial treatments for Mandarin orange in relation to growth, prolaxity, fruit quality, prevention of decline and root disease.
8. Budding trials with Mandarin on different rootstocks for starting study on rootstocks for Mandarin orange.
9. Raising a large scale nursery on various fruits and other plants.
10. Trials on spacing and method of planting of tapioca.
11. Varietal trial of tapioca to select the varieties best suited for popularisation in the tract.
12. Trial of different crops to determine their suitability for cultivation in the tract.

## C-COLLEGE FARMS.

CENTRAL FARM, COIMBATORE.

(COIMBATORE DISTRICT.)

### Results achieved in research during 1949-50.

*Cultural experiment.*—In this experiment between the four types of preparatory cultivations given to garden lands, there were no significant differences in the crops *cholan*, cotton and *ragi* raised. The preparatory cultivations given are



1. Ploughing with P.S.G. 16 C. Plough once, followed by country plough once.

2. Ploughing with P.S.G. 16 C. Plough once, followed by country plough twice.

3. Ploughing with country plough thrice.

4. Ploughing with country plough six times.

The trial was given up as no significant results were obtained since the inception of experiment.

*Rainfall yield correlation experiment.*—The trial was continued for the ninth year on the crops *ragi* and cambodia cotton. It is a long range experiment and has to be continued for some years.

*Irrigation experiments (A).*—The object of this experiment is to determine the water requirements of the *ragi*, *chulam* and cambodia cotton. The experiment has been conducted from 1938-39 onwards and it was concluded during the year. *Ragi*, *chulam* and cambodia cotton require 24, 20 and 25 acre inches of water respectively.

*Irrigation experiment (B).*—In these experiments, the interval between irrigations given and depth required was studied for the crops *ragi*, *chulam* and cotton. The trials were going on since 1938-39. The general conclusions are that *chulam* requires 3" of water every two weeks. The treatments have not produced any significant differences in cotton due, probably, to the heavy North East Monsoon rains. *Ragi* requires weekly irrigations with 2" or 3" depth of irrigation water.

*Boron effect on sweet potato and Lucerne.*—The experiments designed to find out the effect of boron on sweet potatoes and Lucerne, did not indicate any significant result. Sweet potato:—Out of five varieties of sweet potato tried one variety I B-22 gave the highest yield of 7.64 tons per acre, followed by I. B. 20 with 7 tons per acre in the first year of the trial.

*Compost experiments.*—The experiment is designed to compare the effects of nightsoil compost, cattle manure and no manure on paddy *ragi*, *chulam*, sugarcane. The treatment effects were not significant.

*Fodder grasses.*—An experiment to compare the fodder grasses Napier, Guinea, Napier X cumbu cross, watergrass and *kolakattai* was laid out and it continues.

Besides affording facilities for training of the B. Sc. (Ag.) students, the supply of the fodder to the dairy stock, and the multiplication of improved strains of all crops, were arranged.

### Programme of work for 1950-51.

Rainfall yield correlation experiment, yield trial of fodder grasses and compost experiments conducted in 1949-50 will be continued. Comparative trial of 5 promising varieties and study of 55 sweet potato varieties will be continued. Maize varieties for fodder will be studied.

Trials with jute, potatoes, Kudzu and *Crotalaria Striata* will be continued.



## AGRICULTURAL COLLEGE FARM, BAPATLA.

(GUNTUR DISTRICT.)

**Results achieved in research during 1949-50.**

*Paddy.*—A total quantity of 40,455 lb. of paddy seed was distributed to the districts for seed purposes.

Among the 7 paddy strains under trial namely MTU. 12., GEB. 24., MTU. 19, MTU. 16, MTU. 7, MTU. 8, and MTU. 6 ; strain MTU. 12 gave a maximum yield of 3,300 lb. of grain per acre.

In a trial in which 10 strains of paddy were tried, namely MTU. 7, Co. 3, ASD. 5, Co. 7, Co. 14, ADT. 3, MTU. 10, SLO. 17 and SLO. 18, strain MTU. 7 proved best of all in point of yield.

As a result of the cultural trials 20 and 45 days old seedlings were found decidedly better than 60 days old seedlings. 4" spacing was best followed by 8" and 12". 3 seedlings per hole gave maximum yield followed by 2 seedlings.

No difference was recorded in the effect of various kinds of manures used in the form of groundnut cake, green leaf and sulphate of ammonium on paddy.

*Other crops.*—In the June-August season, among the Bengal Jute varieties tried, Chinsurah-green gave a maximum yield of 1,740 lb. of fibre followed by D. 154. In January-May season, the Bengal jute was stunted in growth. Wheat was grown in drylands between December-March season, and an acre yield of 540 lb. of grain was obtained. 14 varieties of sweet potato received from Almora were studied and B. 4004, B-219 Pelicon Progressor and Unit No. 1 Portorica were promising varieties, producing good sized tubers.

**Programme of work for 1950-51.**

The farm taken on lease at Machavaram was closed on 30—6—1950 and the permanent College farm was opened at Bapatla on 1—7—1950. As the new farm is still in its early stages of layout, no regular cropping was so far programmed. However some trials with Bengal Jute varieties, sweet potato varieties and hybrids of tomatoes, perennial cottons, cucumbers and gogu types will be conducted in the New College Farm.



## GLOSSARY OF VERNACULAR TERMS.

Arika (Telugu)	...	...	<i>Paspalam scrobiculatum</i> , L. (A minor millet).
Chinnamanjal cholam (Tamil)	...	...	A variety of yellow cholam.
Chinnapathi (Telugu)	...	...	A variety of cotton.
Cholam (Tamil)	...	...	<i>Sorghum</i> spp. (Great millet).
Cumbu (Tamil)	...	...	<i>Pennisetum typhoides</i> , Stapf and Hubbard (Spiked millet).
Daincha (Tamil)	...	...	<i>Sesbania bispinosa</i> , Fawcett and Rendle, Pers (A green manure crop).
Dalwa (Telugu)	...	...	Second crop paddy season in the Circars.
Ganti (Telugu)	...	...	Same as cumbu.
Gogu (Telugu)	...	...	<i>Hibiscus cannabinus</i> , L. (Fibre crop).
Gorru (Telugu)	...	...	A country seed drill common in dry farming tracts of the State.
Guntaka (Telugu)	...	...	An indiginous blade harrow common in dry farming tracts of the State.
Irungu cholam (Tamil)	...	...	A variety of cholam.
Jonna (Telugu)	...	...	Same as cholam.
Kar (Tamil)	...	...	The early agricultural season of Tanjore delta (June to September).
Kolinji (Tamil)	...	...	<i>Tephrosia purpurea</i> , Pers (Green manure crop).
Korra (Telugu)	...	...	<i>Setaria italica</i> , Beauv (Italian millet).
Kuruvai (Tamil)	...	...	An early season paddy crop of Tanjore tract (June to September).
Modan (Malayalam)	...	...	The uplands of Malabar where dry cultivation is practised.
Mung (Hindi)	...	...	Blackgram— <i>Phaseolus Mungo</i> Var. <i>Radiatus</i> Hook.
Navarai (Tamil)	...	...	The late paddy season of Central Districts. (January to April.)
Panivaragu (Tamil)	...	...	Same as variga.
Periamanjal cholam (Tamil)	...	...	A variety of yellow cholam.
Pillipesara (Telugu)	...	...	<i>Phaseolus trilobus</i> , Ait. A fodder cum green manure crop, common in the Circars.
Pishanam (Tamil)	...	...	Same as Samba.
Punasa (Telugu)	...	...	The early agricultural season (June to September.)
Pyru (Telugu)	...	...	The late agricultural season (Sept.—Oct. to Dec.—Jan.)
Ragi (Tamil)	...	...	<i>Eleusine coracana</i> , Gaertn (Bird's foot millet).
Sajja (Telugu)	...	...	Same as 'Cumbu.'
Samba (Tamil)	...	...	The main agricultural season (Aug. to Jan.)
Samai (Tamil)	...	...	<i>Panicum miliare</i> , Lam (A minor millet).
Sencholam (Tamil)	...	...	A variety of red cholam.
Sesbania	...	...	<i>Sesbania speciosa</i> (A green manure crop similar to 'Daincha.')
Talavirichan Cholam (Tamil)	...	...	A variety of 'cholam.'
Tenai (Tamil)	...	...	Same as 'Korra.'
Thaladi (Tamil)	...	...	The late paddy season in Southern districts (Oct. to February.)
Varagu (Tamil)	...	...	Same as 'Arika'
Variga (Telugu)	...	...	<i>Panicum miliacum</i> , L. (A minor millet.)
Vendai (Tamil)	...	...	Ladies' finger— <i>Hibiscus esculentus</i> .
Vempali (Telugu)	...	...	Same as 'Kolingi.'
Udu (Tamil)	...	...	A system of paddy cultivation in Tanjore delta where a long duration and a short duration varieties are grown mixed together.

## OTHER TERMS USED.

Acenapthene	...	...	A chemical used for seed treatment.
Agrosan	...	...	A Fungicide.
Alkalinity	...	...	A condition of soil with excessive injurious salts.
Black-arm	...	...	A disease of cotton.
Blast	...	...	A disease of rice.
Buck Wheat	...	...	A cereal also used as a green manure crop in the Hills.
Colchicine	...	...	A chemical used for seed treatment.



Jassid	...	...	...	An insect pest on Cotton.
Lupin	...	...	...	A green manure cum pulse crop of the Hills.
Panama disease	...	...	...	A disease of bananas.
Salinity	...	...	...	Slight alkalinity.
Striga	...	...	...	A plant pest on Sorghum.
Smut	...	...	...	A disease of Jonna and Sugarcane.
Ultraphos	...	...	...	A kind of Phosphatic manure.

# ABBREVIATIONS USED FOR DEPARTMENTAL STRAINS.

A.D.T.	...	...	...	Aduthurai.
A.K.P.	...	...	...	Anakapalle.
A.S.D.	...	...	...	Ambasamudram.
B.A.M.	...	...	...	Berhampore.
B.C.P.	...	...	...	Buchireddipalem.
Co.	...	...	...	Coimbatore
G.	...	...	...	Guntur (Lam).
G.E.B.	...	...	...	Government Economic Botanist.
H.	...	...	...	Hagari.
M.T.U.	...	...	...	Maruteru.
N.	...	...	...	Nandyal.
P.L.R.	...	...	...	Palur.
P.T.B.	...	...	...	Pattambi.
S.R.	...	...	...	Saline resistant.
S.L.O.	...	...	...	Samalkota.
T.M.V.	...	...	...	Tindivanam.





**GOVERNMENT OF MADRAS**  
(FOOD AND AGRICULTURE DEPARTMENT)

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