

411

Regd. No. M. 5155.



411

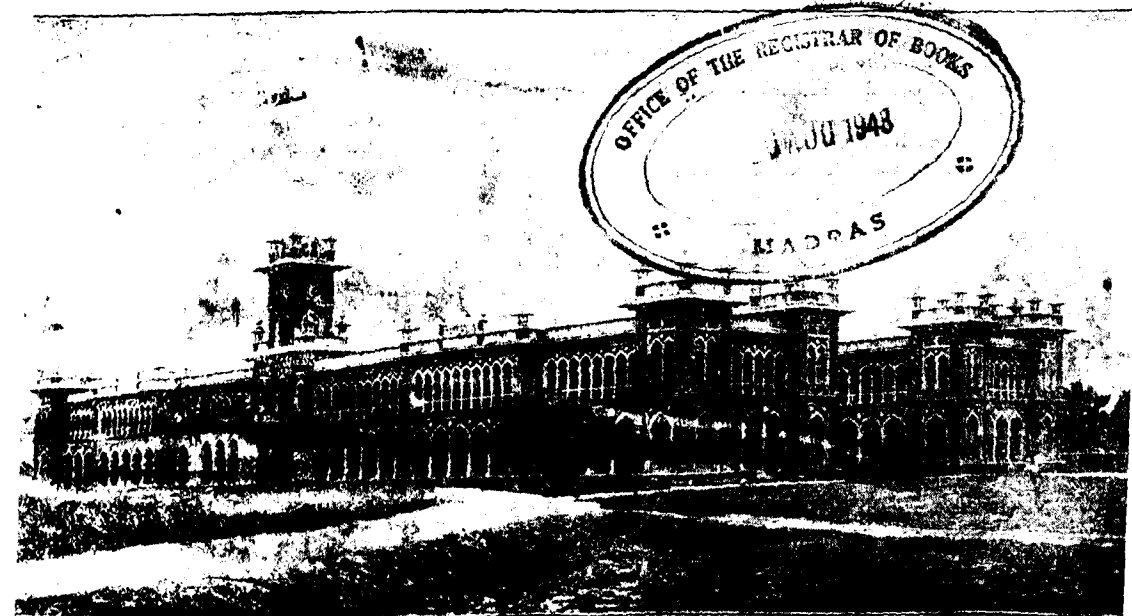
Madras Agricultural Journal

46

Vol. XXXV

July 1948

No. 7



AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE.

Published by
THE MADRAS AGRICULTURAL STUDENTS' UNION,
AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE,
COIMBATORE, S. INDIA.

Annual Subscription:

Inland Rs. 4-0-0
Foreign Rs. 4-8-0

Single Copy
As. 6

LA6

The Madras Agricultural
Journal

1948 - July

VOL. 35. NO. 7



JL
Jm 211, N13
N48.35.7
94654

The Madras Agricultural Students' Union.

This is an association of the students, past and present, of the Madras Agricultural College, and of the officers of the Madras Agricultural Department, the Principal of the Agricultural College being the President, *ex-officio*. The Union conducts this Journal and celebrates annually the College Day on which occasion it convenes an Agricultural Conference. The Association has Members, Associates, Honorary Members and Patrons. For detailed particulars apply to the Secretary.

The Madras Agricultural Journal.

A Premier Agricultural Monthly in India.

Editorial Board:

D. Viswanatha Reddy.

T. R. Narayana Ayyar.

C. Balasubramania Mudaliar.

Dr. N. Krishnaswami.

K. Meenakshisundaram.

C. S. Krishnaswami Ayyar (Asst. Mycologist).

Vacant, (Student).

Vacant, Secretary, Students' Club (*ex-officio*).

A monthly journal in English devoted to the study and development of Agricultural Science; contains articles of scientific as well as of general interest written in popular language Review of agricultural publications and extracts from various journals—both Indian and foreign—a special feature. Commands a wide circulation and is an excellent medium therefore for advertisements.

Rates of Subscription.

Journal supplied free to Members, Associates and Patrons of the Union.

Annual subscription rates for others:

	Rs.	A.	P.
India and Ceylon ...	4	0	0
Foreign ...	4	8	0
Single number ...	0	6	0

Rates of Advertisement.

For single insertion:

	Rs.	A.	P.	Liberal discounts are allowed for standing matter provided space is booked ahead and pre-payment made
For full page ...	6	0	0	
For half page ...	3	8	0	
For quarter page ...	2	0	0	

Inside cover pages 25 per cent extra.

Outside cover pages 50 per cent extra.

Preparation of blocks unless supplied by advertisers charged extra.

N. B.—All advertisements are subject to the approval of the M. A. S. U. Managing Committee before insertion. The charges are strictly payable in advance.

Contributions to the Journal.

Contributions on subjects of agricultural interest or pertaining to rural economy and co-operation will be accepted for publication, subject to approval of the Editorial Board. Correspondence and queries on agricultural and allied subjects are invited. Manuscripts should be sent clearly written or typed on one side of the paper only.

Twenty-five copies of reprints of contributions will be presented to authors. Extra copies and printed covers for reprints, if required can be supplied at actual cost if intimation is given when the manuscript is presented.

N. B.—The Editorial Board does not hold itself responsible for the opinion expressed by the contributors.

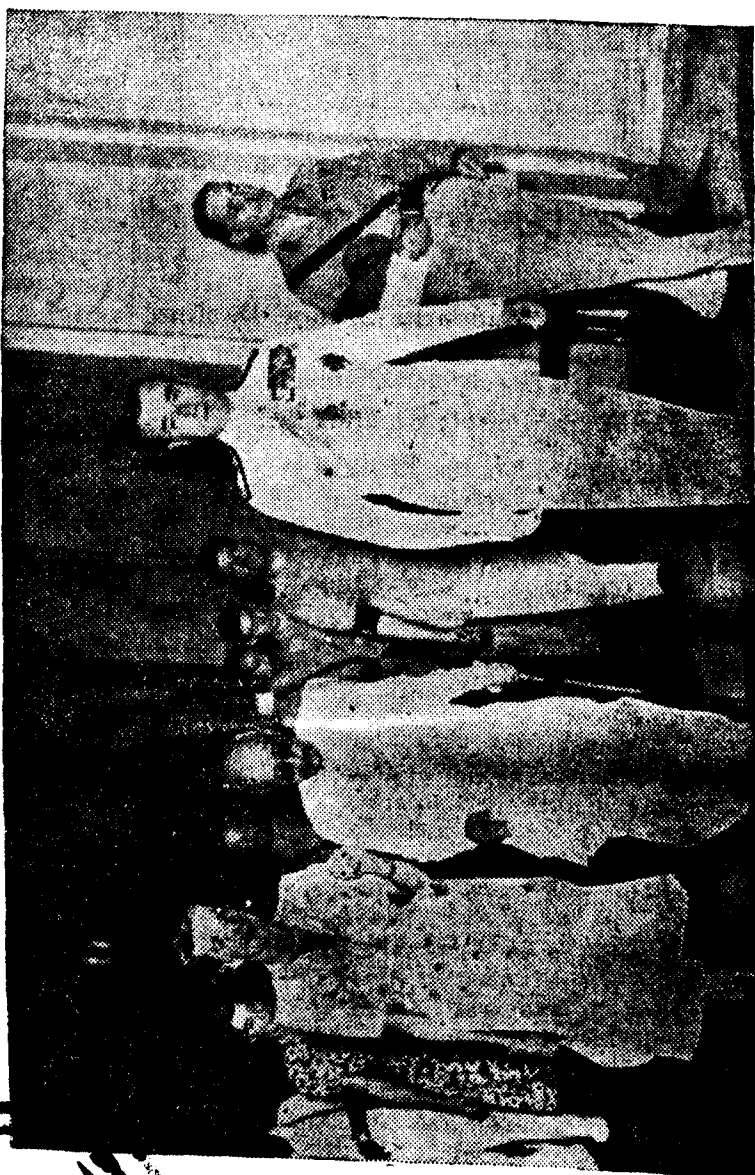
All communications should be addressed to:

The Secretary, M. A. S. Union,
Agricultural College, Lawley Road P. O., Coimbatore.

CONTENTS.

	PAGE.
Editorial ...	135
Original Articles:	
(1) More Money from Vegetables on Drylands ... By S. V. Duraiswami	137
(2) A Note on the Mandarin Orange Decline ... By U. Narasinga Rao	141
(3) Manurial Experiments on Rice ... By C. Hanumantha Rao	144
Research Notes ...	150
Weather Review ...	151
Departmental Notifications ...	153





THE FIRST INDIAN GOVERNOR-GENERAL

The Madras Agricultural Journal

(ORGAN OF THE M. A. S. UNION)

Vol. XXXV

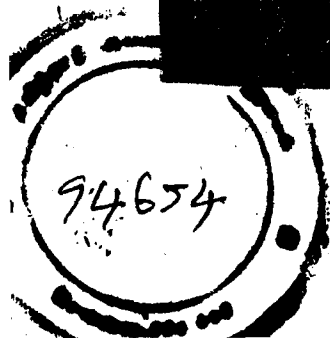
July 1948

No. 7

Editorial

Agriculture in the Birla Plan: Among the many problems that confront the Government and people of India today, undoubtedly the most important is that of increasing the level of production of agricultural commodities and industrial goods. World war II and its aftermath, have made us realise that our national out-put even of basic necessities of life such as food and clothing is woefully inadequate, and the first step in national reconstruction is to increase our resources in this direction. In order to make available to the population of this country the minimum nutritional requirements as judged by accepted standards it has been computed that we should increase the existing production of cereals by 10 percent, pulses by 20 percent, fats and oils by 250 percent, fruit by 50 percent, vegetables by 100 percent, milk by 300 percent and fish and eggs by 300 percent. Besides this there is need for increased production of cotton, to clothe the people, and of other cash crops to furnish raw material for our industries, and provide the money required to meet our import obligations.

The attainment of the desired results in the matter of self sufficiency and making provision for a better standard of living calls forth organised effort. The formulation of a co-ordinated plan of all round development based on realisation of existing resources, and the working out of ways and means to implement it are pre-requisites to such an effort. Among the many plans drawn up for this purpose, the latest in the field is the 'Birla' plan. The plan aims at placing India on a self sufficient basis in the matter of food production and industrial out-put within a period of five years. Though formulated mainly from the industrialists' point of view, the plan takes cognizance of the fact that the development of agricultural resources is of prime necessity. In the plan provision is made for an expenditure of Rs. 848 crores on agriculture besides Rs. 54 crores provided for the establishment of a fertilizer industry, out of a total estimated expenditure of Rs. 1,220 crores for all items during the period of five years. The allocation for agriculture, is generous and we note that nearly 70 percent of the agricultural budget is to be earmarked for increasing food production, and the balance for the improvement of cotton and sugarcane. The skeleton proposals for increasing



JL
Jm 211, N13
N48-35.7

the food production, are drawn up on the usual lines, and will meet with general approval but we are of opinion that the additional national income envisaged in the plan is unduly optimistic, especially with regard to the income expected to be realised by the utilization of waste lands. Pressure of population and economic necessity have already driven our cultivators, to encroach on large tracts of marginal lands even at present, and we are doubtful if within a short period of five years, any appreciable portion of new land could be brought under the plough and made to yield profitable returns. If the experience gained during the last five years in connection with the grow more food campaign is any guide we have to guard against placing too much reliance on our ability to augment our production by the utilisation of waste lands, in a short time. Any haphazard and hasty attempt to reclaim culturable wastes, will in our opinion be doomed to failure. The reclamation of waste lands is a long range problem, and must be preceded by carefully conducted surveys, to mark out lands which are likely to yield returns commensurate with the money spent on the enterprise. Again it is our considered opinion, that the cultivation of such lands should be carried out on a scientific basis, by large scale farmers, or corporate bodies or the state itself under guidance of expert technical advice in regard to clearance, cultivation, manuring and choice of crops.

The amounts provided for irrigation and multipurposes projects, are Rs. 75 crores and Rs. 100 crores, respectively, and call for no comment, but the amount of Rs. 8.5 crores allocated under the item 'improved varieties' is all too meagre. To provide for a research organisation in keeping with the ambitious programme envisaged in the plan, this amount should be increased considerably.

With regard to manuring, the authors of the plan would appear to pin their faith entirely on the fertilizer industry, which the plan proposes to set up, without taking into account the possibilities of augmenting the supply of organic manures by a well defined policy of forestation, conservation of village and town refuse and growing of green manures. This omission is a fault, and while we concede that there is scope for utilisation of large quantities of artificial fertilizers in future crop development, the neglect of organic manure will spell disaster to our basic industry.

So far for the plan. But no paper plan however perfect could by itself deliver the goods. Success depends on the way in which all groups unite in directing their energies and efforts towards the common cause of increasing the national output.

More Money from Vegetables on Drylands

By

S. V. DURAISWAMI, B.A., B.Sc. (Ag.)

(Lecturer in Agricultural Economics, Agricultural College, Bapatla)

Vegetable cultivation is common in the neighbourhood of cities and towns under lift irrigation and this may be termed as commercial farming on intensive lines. The possibility of growing vegetables on a remunerative basis under dry farming conditions either on commercial or intensive lines, has not been thought of previously. Therefore it is of great interest to know that in Guntur Taluk there is a tract comprising four or five villages which grows vegetables of the common types on a field scale under entirely dry conditions. This tract is about 5 to 7 miles equidistant from the towns of Guntur and Tenali and the total area under vegetables grown in this manner is said to be nearly 2,000 acres. It is evidently a fruitful combination of climate (rainfall), soil and market that has been responsible for this new and interesting system of farming.

The climatic conditions. It must be admitted that the distribution and amount of rainfall is more favourable in the Guntur tract than in many other dry tracts situated elsewhere. It was pointed out in a previous article by the author, how this feature has helped in the raising of very good crops of millets, chillies, tobacco etc., almost equal to garden crops, under dry farming conditions. ('Climate and crop production in the Guntur black soils' M. A. J. September 1940). With an average of 15 inches of rainfall for each of the South-West and North-East Monsoons and 5 inches for the summer period, it has been demonstrated by the ryots themselves that it is possible to grow many of the common vegetables such as brinjal, beans, bitter gourd, cucumber etc., on a field scale in large areas and get a net return of about Rs. 300 to 500 per acre.

The soil. Two types of soils can be distinguished in this tract, the black and the red, though the former may cover more area. Both kinds are fairly deep and highly fertile and retentive of moisture. The rotation of cropping is different in the two types of soils. The secret of success lies in the following factors. 1. Adequate and well-distributed rainfall; 2. Retentive soil responding well to manuring; 3. Good markets being situated nearby.

Rotation of cropping. It is just possible that this system of cultivation was tried on a small scale during the pre-war period, about a decade back. The high prices prevailing in the later years might have given a great fillip to this practice which has extended itself remarkably and which should have naturally disturbed the previous rotation of crops with millets, chillies and tobacco. Though these crops are not entirely excluded in the present rotation, they occupy less important places

compared to the newcomers, which almost dominate the scene any time of the year. However, the present system of rotation in both kinds of soils appear to be good enough as they have been fixed from experience gained in previous years, to suit the conditions of the market and the economic needs of the cultivator. As for the actual rotation, the following order of cropping is generally followed. In the black soils in the first year, brinjals and country beans, or bittergourd, or snakegourd; in the second year, cumbu or groundnut; in the third year, chillies or variga or tobacco. In the case of the other type of soil, in the first year cucumber (*Dosaikkai*) and in the second, groundnut. There are other minor crops like maize and tomato which may also be cultivated on small areas interspersed in this rotation for the fodder needs in one and quick returns in another.

Labour. As is common everywhere in the Province, this is also a tract of small holders. Each cultivator owns a pair of work bullocks and utilises his own and his family labour largely. Many do not employ casual labour at all. This of course accounts for the large net return obtained by them. Each one also owns a cart which is utilised to cart the produce to the town market as often as is necessary. Some of the owners have also taken up more areas for cultivation on lease and the number of pure tenant cultivators may be negligible. In general, labour is available and the rates of wages are not higher than elsewhere in the neighbouring tracts. Under the conditions of this type of commercial vegetable farming the owner cultivator alone can succeed to keep up the high level of profits.

Seasons and special features. The two important seasons of planting are June-July and October. These correspond to the starting of the two monsoons respectively. After planting of the seed or seedling as the case may be, a few waterings are given from the small ponds found in each holding, one or more, which store water by springs as well as by rain water flowing into them. In the later stages, even if water is available in these ponds, watering is not resorted to as it may not be necessary or irrigation costs often become so high as to be prohibitive. For the country bean and snakegourd creepers, continuous and extensive pandals are erected with bamboos and coir rope, which means great initial cost. But the bamboos are used for three years or more. Minimum intercultivation is given and fields particularly under country beans were found to be quite weedy. The planting time and duration of the more important vegetables are given below.

Vegetable.	Planting time.	Duration.
Brinjal	June	3½ months.
Country beans	September	6 "
Bittergourd	October-Dec.	7 "
Snakegourd	October	6 "
Cucumber	June and Oct.	3 "

Manuring. The importance of adequate and proper manuring has been realised by the cultivators, but owing to the nonavailability of cakes and artificials a regular scheme of manuring has not been established. However a basal dressing of about 5-10 tons of farmyard manure is the rule for most of the vegetables. Sheep-penning is also done at about a thousand sheep per acre. Groundnut cake has also been applied in recent times and the results have been very encouraging. If available, ammonium sulphate is applied to snakegourd and some special watering is undertaken. Orthodox agronomists would not reconcile themselves to the fact that it is possible to utilise fully heavy doses of manure in these soils without adequate irrigation. It is the retentive soil and the well distributed rainfall that makes this possible. By a regular application of the organic manures the fertility level of the soil has been not only kept up but has also improved year by year.

Marketing. The produce is sent to the town market in the cultivators' own carts everyday. During the peak season it is estimated that as much as four tons of vegetables may reach the markets, daily. Individual marketing is the rule at present, but quicker transport and co-operative marketing have to be developed as early as possible so that dryage and wastage may be eliminated and larger returns secured to the grower.

Profit from an acre. It will be interesting to work out the average profit per acre of some of the vegetables so as to compare with those obtained elsewhere under irrigated conditions or other crops grown under dryfarming conditions. The following statement gives the cost of production according to the different stages of field operations and the net return per acre.

Detail of operation.	Country beans. Rs.	Brinjals. Rs.	Bitter-gourd. Rs.	Snake-gourd. Rs.	Cucumber. Rs.
Preparatory cultivation ...	...	30	30	30	30
Seeds and Planting ...	10	15	15	15	15
Special Expenses (Pandal) ...	100	...	...	100	...
Manuring ...	10	40	30	30	30
After cultivation ...	5	40	30	10	30
Harvesting ...	100	30	30	30	30
Total cost of cultivation ...	225	155	135	215	135
Gross return per acre (approximate) ...	800	350	450	600	350
Net return per acre ...	575	195	315	385	215

The cost of production noted above includes labour charges of own and family labour. Hence considering actual receipts in cash the net return is likely to be more. This is a noteworthy feature in the economics of this farming.

It is commendable that the ryots of this tract have shown considerable enterprise in having evolved successfully what may be termed commercial farming of vegetables on extensive lines. It may be argued that if prices of vegetables in the town markets fall very low the high profits now realised may not be obtained. Prices of vegetables will go down only when there is considerable increase in the production as well as extension in the area under cultivation in the neighbourhood of towns and cities. This cannot happen in the near future since the limiting factor for further development is greater availability of irrigation resources. But it can be shown that even if prices of vegetables come down, it may still be possible to obtain very reasonable profits in this kind of farming, because of the low cost of cultivation. The comparison of profits from vegetables is to be really made with those obtained from raising of the usual crops of tobacco or chillies, the cost of cultivation of these being much higher. It may however be envisaged that if prices of vegetables fall to near about pre-war level, the area under vegetables may have rapid reduction from year to year.

There may be tracts in other districts such as Nellore and Chengelpet in the East coast, situated adjacent to towns, where vegetable growing on drylands may be a profitable proposition. But in these districts the benefit of both the Monsoons is not always available. It is a matter of trial by local enterprising ryots to see whether they cannot get very much more by raising common vegetables and marketing in the nearest town, rather than from the usual crops or millets or pulse or dry paddy etc., in the rotation. It is again, a question of how best one is able to combine profitably in a given tract, the three factors already mentioned, viz., climate, soil and market.



A Note on the Mandarin Orange Decline

By

U. NARASINGA RAO

(Assistant Fruit Specialist, Coonoor.)

The mandarin orange is estimated to be grown over an area exceeding 10,000 acres in this province. Its cultivation is confined largely to the hilly tracts and extensive belts under this fruit are met with on the slopes of the Nilgiris, Shevroys, Lower Palnis and Wyanad between the elevations of 1,250 feet and 4,500 feet above sea level. The fruit is grown universally under rainfed conditions and more often than not as an associate crop mainly with coffee and to a less extent with tea. Being treated more or less as a plantation crop the production costs are low, and the fruit is therefore an important complement in the fruit wealth of the province.

Unfortunately, since 1945, the mandarin orange grower is facing a hitherto little known menace, popularly known now as the 'die-back' or 'decline' in oranges. Trees affected by this malady exhibit their shoots in various stages of drying up from tip downwards accompanied by severe defoliation of branches. They present a general appearance of unhealthiness which culminates within two or three years in a premature death of the trees irrespective of their age.

The incidence of this disease is becoming widespread and it has been observed to be prevalent in all the mandarin orange tracts. Since it is recognised that this affliction, if unchecked, might ruin this important fruit industry in the long run, a scheme for the investigation of its causes and cure is to be put into execution shortly. It is, however, felt that a brief analysis of the probable causes for the occurrence of this disease and listing out the steps that could be taken as a measure of first aid, would be of use to the grower in seeking some protection against the mandarin orange tree decline he is up against.

It must be admitted at the outset that no single causative factor responsible for the die-back, has yet been isolated.

The mandarin orange growers have numerous theories relating to the cause of the die-back, the more important of which are as follows:—
(1) Till 1945, the trees were invariably healthy; in that year, a most serious widespread drought occurred and this was associated with a bumper crop; in the succeeding year and thereafter decline set in,

resulting in die-back, which is therefore attributed to exhaustion due to drought and overbearing by the trees (2) The trees bear well in the first four or five years of cropping and then decline sets in, because at this stage the rootsystem strikes either the bauxite sub-soil or rock, the soils chosen for orange growing being characterised almost everywhere by these underground features (3) the decline is due to some undetermined fungus disease and (4) the decline is due to the exposure of the trees to sun; this is presumed from the fact that such of the orange trees which happen to be under shade in coffee estates, generally show no symptoms of die-back. The protagonists of this theory have now commenced to provide a shade crop of either *Erythrina* or silver oak in their orchards. All these theories, seemingly plausible, leave various relevant points unanswered. It seems possible that die-back is a summation of the effects of several adverse factors the tree has faced and has not been able to resist and overcome, and is therefore more a symptom of distress shown by the orange tree due to several causes. It is generally agreed that the coffee planter, who is one of the most important among mandarin orange growers, has invariably selected the poorest patch of his holding for this fruit, with a surface soil barely a foot in depth. More often than not, below this, rock abounds and severely restricts the root-feeding zone. The trees which have grown beyond the capacity of the surface soil begin, therefore, to suffer and die-back results. In coffee estates, where the orange trees are grown as a shade crop, it is possible that root competition between orange and coffee trees commences when the former have grown to a certain age and they fail in the struggle that sets in between the two crops. The fact that certain orange trees do not exhibit die-back under heavy shade may probably be due, more to the favourable soil environment in the particular site than to the direct benefit of shade. It is also possible that the mandarin orange at a particular age is not able to maintain itself under rainfed conditions, in regions where rainfall is only about 60 inches annually and where it is not distributed well. There is generally a long rainless period of three months from January to March in almost all the orange growing tracts during which the mandarin orange tree may not be able to sustain itself on the scanty water resources of the soil. There is again the widespread practice of digging the soil around the trees to a depth ranging from one to two feet twice in a year either for turning the manure in or for root pruning. This results in severing much of the fibrous roots of the tree resulting in incalculable harm to its general health.

With impaired health of the tree due to any or all of the above conditions, diseases such as mildew, sooty mould and others find no difficulty in gaining a foot hold. Die-back under such conditions rapidly follows and the grower, unsuspecting till the visible symptoms of defoliation and death of shoots face him, is prone to attribute the entire

trouble to the incidence of disease. The solution of the problem seems to lie in the following directions:

- (1) Selection of better sites for the mandarin orange where the soil is comparatively deeper and richer.
- (2) Provision of irrigation in times of necessity and of a soil cover in the form of mulches during summer.
- (3) Cessation of the harmful practice of root-pruning or digging deep around the tree basins which results in severing of the fibrous roots of the trees.
- (4) Adoption of a more liberal fertiliser programme employing organic manures and green manure crops in the monsoon period to be dug in later, which would increase the water holding capacity of the soils.
- (5) Adherence to a regular spray schedule to obviate the incidence of diseases. and,
- (6) Exploration of the possibility of a change-over from seedlings to trees grafted on a hardy, shallow-rooted, drought-resistant root stock.

The first five items above are such as can be adopted by the mandarin orange grower straightaway as steps leading to an improvement in general terms on the existing conditions. It is hoped, therefore, that this note will be of some use to him in tackling the problem of mandarin orange decline as it confronts him today.

Manurial Experiments on Rice

1. Application of Cakes as Nitrogenous Manures

By

C. HANUMANTHA RAO, B.Sc. (Ag.)
(Agricultural Research Station, Anakapalle.)

Introduction. Vizagapatam in area is third in importance as a rice-producing district in the Madras Province. This crop occupies 7,429,000 acres. It is the staple food of the population and is supplemented by Ragi (*Eleusine coracana*) and pearl millet (*Pennisetum typhoides*). The average yield of rice in India is low when compared with those of other countries, such as Spain and Italy. The application of artificial fertilisers increases yields but their extensive use is neither economical nor beneficial to the soil in the long run.⁽¹⁾ In India organic manures are the most desirable for the improvement of soil as well as for yields of crops. Among the many organic manures, oil cakes are very popular in this district. The extent of their application is naturally limited to their availability. In Vizagapatam District about 36,000 tons of groundnut cake are available per annum. Besides this, other cakes such as castor cake and Pungam cake (*Pongamia glabra*) are also available in smaller quantities. It is necessary to find out which of these are the most suitable to the crop under the conditions of soil and climate of this district. Before recommending any particular level of nitrogen on a large scale, it is necessary to evaluate the most profitable amount of the manure commensurate with the cost of its application.

To find out the optimum amount and the type of cake to be applied for increasing the production in rice, two experiments were conducted at the Agricultural Research Station, Anakapalle from the year 1942-43 to 44-45. The results of these experiments are presented in this paper.

Review of Manurial Experiments in Madras. The Paddy Specialist and the Government Agricultural Chemist⁽²⁾ have recently reviewed the manurial experiments conducted during the period 1930 to 1940, at the six of the Agricultural Research Stations of the Province and it is not considered necessary to cover the same field now in any detail. These experiments fall into three groups i. e. (1) application of nitrogenous manures alone in the form of green manure or cake or ammonium sulphate, (2) Combination of organic and inorganic nitrogen, (3) Nitrogen and Phosphate combinations. The summary of conclusions based on these experiments for nitrogenous manures is presented in table I. These conclusions are limited to the experiments conducted during the period referred to above and to the tract covered by the respective Agricultural Stations.

TABLE I.

Station.	Manures recommended and dosage per acre.
Maruteru	... Green manure 4,000 lbs. or G. N. Cake 675 lbs. or ammonium sulphate 100 lbs.
Samalkot	... Green manure 6,000 lbs. or ammonium sulphate 150 lbs.
Anakapalle	... Green manure 6,000 lbs. to 8,000 lbs.
Adathurai	... Ammonium sulphate 150 lbs. or green manure 4,000 lbs.
Coimbatore	... Ammonium sulphate 150 lbs. or G. N. Cake 425 lbs. or green manure 6,000 lbs.
Pattambi	... Ammonium sulphate 150 lbs. or G. N. Cake 425 lbs. or green manure 5,000 lbs.

In general, it may be said, that cakes are superior to the application of green leaf alone and a combination of the two is better than either. At Pattambi it was noted that groundnut cake and castor cake were more economical than neem cake. An experiment conducted at Agricultural Research station, Palur, over a period of 14 years, indicated that continuous application of ground nut cake and castor cake at 500 lbs. per acre did not show any cumulative or deleterious effect and the yields of rice increased by 16%.

Experiments at Anakapalle. In one experiment, groundnut cake, Pungam (*Pongamia glabra*) cake and Castor cake were tried as manures on a pure line A. K. P. 3. These cakes were applied to supply 0 lbs. 20 lbs. 40 lbs. and 60 lbs. nitrogen per acre. This experiment was on a factorial design with six replications, in randomized blocks. In the second experiment, groundnut cake to supply 0 lbs. 30 lbs. and 60 lbs. nitrogen was applied to five important pure lines grown extensively in the tract viz. G. E. B. 24, A. K. P. 3, A. K. P. 6, B. A. M. 6 and B. A. M. 8. This experiment was also laid out on a factorial design with four replications in randomized blocks.

The local practice is to raise dry nurseries and transplant the seedlings, when the South West Monsoon sets in and water becomes available in the channels. The same practice was adopted in the present experiments also. The nurseries were sown early in July but the transplanting were at times delayed due to late setting of the monsoon; when the period in the nursery was prolonged and the post transplantation period was reduced. It will be shown later that this transplantation period is an important factor in determining the yields of paddy in this tract. The data from Experiment 1 are presented in table II below:

TABLE II.

Yield of grain and straw in lbs. per acre.

Levels of Nitrogen.	Yield of grain/straw in lbs. per acre and percentage increase of yield over the standard.							
	1942-43.		1943-44.		1944-45.		Average of three years.	
0 lbs.	2380/2510	0	1744/2325	0	1814/2296	0	1979/2367	0
20 lbs.	2745/2946	15/17 %	2260/2851	30/22 %	2135/2733	15/19 %	2380/2843	20/19 %
40 lbs.	3102/3254	30/30 %	2704/3297	56/42 %	2508/3539	30/54 %	2771/3363	38/42 %
60 lbs.	3478/3758	46/49 %	2992/3624	72/56 %	2802/4300	46/89 %	3091/3894	56/65 %
Significance	Yes	...	Yes	...	Yes	...	...	...
Critical	difference 208/436		219/310		91/373			

The data presented in table II indicate that oil cakes in any form applied, on nitrogen basis, benefit the rice crop and increased levels of nitrogen increase the yields of grain and straw whatever be the nature of the cake. There was no significant interaction between kinds of cake and levels of Nitrogen.

TABLE III.

Yields of grain and straw in lbs. per acre.

Levels of Nitrogen.	Yield of grain/straw in lbs. per acre and percentage increase of yield over the standard.							
	1942-43.		1943-44.		1944-45.		Average.	
0 lbs.	2324/2600	0	1320/1810	0	1733/3184	0	1792/2531	0
30 lbs.	2761/3165	19/22	1891/2824	43/56	2086/3909	20/23	2246/3299	27/34
60 lbs.	3068/3839	32/48	2330/3112	76/110	2343/4596	35/44	2580/4085	48/68
Mean	2718/3201	17/23	1847/2118	40/56	2054/3896	18/22	2206/3305	25/34
Significance	Yes	...	Yes	...	Yes	...	...	...
Critical	difference 296/361		251/466		122/784			

VARIETIES.

B. A. M. 8	2985/3499	1918/3316	2224/4033	2376/3616
A. K. P. 6	2895/3210	1950/3006	1957/3119	2267/3345
A. K. P. 3	2614/3048	1793/2515	2000/3572	2136/3046
B. A. M. 6	2604/3167	1972/2657	2053/4161	2209/3328
G. E. B. 24	2491/3081	1604/2567	2032/3894	2042/3181
Significance	Yes	Yes	Yes/No	
Critical	difference 246/380		281/414	
			158/...	

The data presented in table III show again that higher doses of groundnut cake increased the yields progressively. Among the varieties under test B. A. M. 8 and A. K. P. 6 gave significantly higher yields than the rest.

It was generally noted that application of about 750 lbs. groundnut cake, to supply 60 lbs. nitrogen per acre tended to increase vegetative growth and the crop was then liable to lodge.

Economics. The cost of manure applied, the net increase in yield over the control and the net profit realised at the market rates prevailing at time of the experiment are calculated and the data are presented in table IV below :—

TABLE IV.

Economics of Manuring.

(a) Kinds of cake and levels of Nitrogen.

Kind of cake.	Levels of nitrogen.	Cake applied in lbs. per acre.	Increased yield of Grain/straw over standard in lbs.	Money value of the increased yield.	Cost of Nitrogen applied.	Profit.
Groundnut cake ...	20	248.3	421/565	32-14-9	8-2-9	24-12-0
	40	496.6	813/1029	63-1-2	16-5-6	46-11-8
	60	745.0	1177/1599	92-1-0	24-8-3	67-8-9
Castor cake ...	20	403.0	366/395	27-14-9	9-13-4	18-1-5
	40	806.0	820/1077	61-9-0	19-10-8	41-14-4
	60	1209.0	1180/1458	91-4-10	29-8-0	61-12-10
Pungam cake ...	20	450.4	399/441	30-8-2	6-4-4	24-3-10
	40	901.4	782/859	59-12-3	12-8-8	47-3-7
	60	1352.1	1064/1547	13-14-10	181-3-0	65-1-10

(b) Varieties and levels of Nitrogen.

Variety.	Levels of nitrogen.	Cake applied in lbs. per acre.	Increased yield of Grain/straw over standard in lbs.	Money value of the increased yield.	Cost of Nitrogen applied.	Profit.
G. E. B. 24 ...	30 N.	372.5	391/695	31-11-5	12-4-2	19-7-3
	60 N.	745.0	720/1498	59-14-6	24-8-4	35-6-2
B. A. M. 6 ...	30 N.	372.5	582/642	44-8-8	12-4-2	32-4-6
	60 N.	745.0	852/1508	69-1-9	24-8-4	44-9-5
A. K. P. 3 ...	30 N.	372.5	450/802	36-8-3	12-4-2	24-4-1
	60 N.	745.0	821/1595	67-8-5	24-8-4	43-0-1
A. K. P. 6 ...	30 N.	372.5	546/567	41-8-1	12-4-2	29-3-11
	60 N.	745.0	968/1573	77-7-11	24-8-4	52-15-7
B. A. M. 8 ...	30 N.	372.5	748/1134	59-5-2	12-4-2	47-1-0
	60 N.	745.0	1024/1560	81-4-3	24-8-4	56-11-11

Castor cake valued at Rs. 2-7-0 per 100 lb.

Groundnut cake valued at Rs. 3-4-8 per 100 lb.

Pungam cake valued at Rs. 1-6-3 per 100 lb.

Grain valued at Rs. 6-14-2 per 100 lb.

Straw valued at Rs. 0-11-0 per 100 lb.

Discussion In addition to the conclusions given later, there are some other important indications from these experiments. Yield in crops is a complex character and is the net result of a number of interacting factors. In addition to the supply of necessary nutrients, in the form of manure and water, there are other factors which bear a profound significance on yield. In our country climate is one such. The climatic effects are more pronounced in districts like Vizagapatam with regard to crops like rice where successful cultivation depends mainly on the monsoon. This district has no assured water supply and the rice planting gets often delayed; when there is a delay in the break of the South West Monsoon. In the late planted crop the post-transplantation period till flowering is short and this affects the yields adversely. In seasons of good rainfall and weather conditions, when the post-transplantation period is long, the yield of paddy is fairly high. In such seasons, the number of tillers per plant, height of plant, length of earhead and number of grains per earhead are generally greater than in seasons of low rainfall and late planting. Under the latter conditions, manuring the field with cakes is very helpful. Increase in yields brought about by manuring in such seasons is much more pronounced than the increase in normal seasons. However one very important fact was that heavy manuring in adverse seasons did not bring up the rice yields to the level of the yields from unmanured plots, recorded in good seasons (vide table II and III). It is a matter for future investigation, whether the increased yield brought about by manures, or seasons is favourably affecting the yield attribute. For instance, at Berhampur addition of manures increased the tillering by 24%, height by 23%, length of panicle by 3%, number of grains by 5.7% and the yield of grain by 56% and the straw-yield by 59%. It is thus evident that the different yield attributes are not all affected to the same extent. Field observations indicate that in seasons of low rainfall and late planting, tillering and height are increased by manuring but such increases do not appear to reach the levels attained normally without manuring in good seasons. Weather in relation to manuring will further be considered in a later paper.

Summary and Conclusions. Two experiments were conducted at the Agricultural Research Station, Anakapalle from 1942-43 to 1944-45 to determine (i) the optimum quantity of nitrogen required for the paddy crop and the response of five popular varieties to different levels of nitrogen in the forms of groundnut cake and (ii) the influence of different forms of cakes with different levels of nitrogen on a medium duration variety. The following are the conclusions.

- (i) Concentrated organic manures like cakes when applied to paddy gave increased yields.
- (ii) Increased doses of nitrogen from 0 lb. to 60 lbs. gave progressive increases in yield irrespective of the nature of cake.

- (iii) There was no interaction between forms and levels of nitrogen between levels of nitrogen and varieties.
- (iv) Among the five popular and widely-grown varieties of rice in the Vizagapatam District, B. A. M. 8 gave the maximum response, closely followed by A. K. P. 6.
- (v) In seasons of delayed planting the post-transplantation period was always short. The increase in yields due to manures was greater in such delayed plantings than in that of normal years.
- (vi) Of the five varieties B. A. M. 8 and A. K. P. 6 gave greater returns.
- (vii) The economics of manuring indicated that application of groundnut cake @ 60 lb. Nitrogen resulted in a net profit of Rs. 68/- per acre.
- (viii) Application of groundnut cake is recommended for increased rice production, especially under late-planted conditions. Though increased doses upto 60 lb. Nitrogen per acre result in increased yields, field observations indicated that it is better to limit the manuring to 40 lbs. of nitrogen per acre so as to avoid lodging and consequential loss in quality and quantity of grain, especially in years of heavy rainfall or on lands subject to inundation.

Acknowledgement. I am greatly indebted to the Superintendent, Sugarcane Research Station, Anakapalle and to my other colleagues on farm for the valuable help rendered in the conduct of the experiments. I am also thankful to Sri. M. B. V. Narasinga Rao, Paddy Specialist, Coimbatore for his valuable suggestions in the preparation of this paper.

Literature Cited.

1. Analysis of manurial experiments—(1925) supplement to volume I. Imperial Council of Agricultural Research.
2. C. R. Sreenivasa Ayyangar and P. V. Ramiah—(1944). A review of the manurial experiments, on the Agricultural crops of the Madras Presidency for the decennial period 1930-1940. *Madras Agri. Jour.* XXXII. P. 89.
3. Annual reports of the Anakapalle Agricultural Research Station, Madras Agricultural Department, 1942-43, 43-44, and 44-45.
4. Annual report of the Agricultural Research Station, Orissa Agricultural Department, Berhampur, 1934-35.
5. Annual report of the Agricultural Research Station, Madras Agricultural Department, Anakapalle. 1943-45.
6. Annual report of the Agricultural Research Station, Madras Agricultural Department, Palur. 1908-21.

RESEARCH NOTES.

A large number of wild and as well as economic Indian plants have not been investigated for their chromosome numbers. A mere knowledge of the chromosome number of the plants would help greatly in the selection of plants especially in hybridisation. Sometimes entire genera lack this information, thus creating a lacuna in the phylogenetic classification and other works. As a part of the Cytogenetic work the investigation of the chromosome numbers of such of the wild, cultivated and economic plants whose numbers have not been investigated is being done. As the first of such investigations a few of the plants are given under:—

1. *Eleusine verticellata* Roxb. This is a wild relative of the cultivated *E. coracana*. The plant is found growing in cooler, more moist places like Kallar etc. It comes up well under cultivation at Coimbatore also. The somatic number is 36, same as in *E. coracana*. (Fig 1) X4900.

2. *Ischaemum aristatum*. Lin. A wild grass growing in large leafy tussocks in the river course at Kallar. The leaves are glabrous. The plant may be tried to be improved for use as fodder grass. The 2nd number = 50. (Fig. 2. X4900)

3. *Cordia sebestena* Forsk. An horticultural plant known commonly as Aloe wood. The whole genus of *Cordia* has not been worked for the chromosome numbers. This plant has $n = 18$ chromosomes. In the complement are characteristically found a pair of large chromosomes. There is pronounced secondary pairing found, in the metaphase plate on the meiosis.

Cytogenetics laboratory,
Agricultural Research Institute,
Coimbatore.

N. KRISHNASWAMY.
V. S. RAMAN.



Fig. 1



Fig. 2



Fig. 3

Weather Review—For June 1948.

RAINFALL DATA.

Division	Station	Actual for month in inches	Departure from normal in inches	Total since January 1st in inches	Division	Station	Actual for month in inches	Departure from normal in inches	Total since January 1st in inches
Orissa	Gopalpur	0.6	-4.9	8.3	South.	Coimbatore	2.3	+0.4	9.2
Circars.	Calingapatam	1.0	-3.7	4.0		C.B.S.			
	Vizagapatam	2.6	-1.5	5.9		Tiruchirapalli	0.9	-0.9	9.7
	+ Anakapalli	4.0	+0.3	6.2		Negapatam	2.4	+1.2	11.3
	+ Samalkota	2.6	-2.0	12.3		+ Aduturai	0.3	-0.8	4.4
	+ Maruteru	3.1	-1.0	4.7		Madura	0.1	-1.5	6.4
	Cocanada	2.9	-1.8	6.0		Pamban	0.2	+0.1	4.1
	Masulipatam	0.4	-3.8	1.5		+ Koilpatti	Nil	-0.4	8.5
	+ Guntur	0.8	-3.4	5.6		Palamkottah	0.6	+0.2	11.7
						+ Amba-			
Ceded	Kurnool	0.8	-2.1	2.6	West Coast.	samudram	1.3	-0.1	11.9
Dists.	+ Nandyal	0.3	-3.2	2.0		+ Pattukottai	0.4	-0.8	5.4
	+ Hagari	0.8	-1.0	3.9		Trivandrum	21.0	+7.8	35.2
	+ Siruguppa	1.8	-1.1**	4.7		Cochin	42.4	+13.9	60.1
	Bellary	0.3	-1.4	4.9		+ Pattambi	34.4	+8.3	44.1
	Rentichintala	0.7	...	5.0		+ Taliparamba	47.3	+5.4	55.5
	Cuddapah	1.4	-1.6	3.6		+ Nileshwar	52.1	+10.5	59.5
	*Anantharajpet†	1.9	-0.5	3.8					
Carnatic.	Nellore	2.8	+1.5	4.0		Mangalore*	32.7	-7.5	39.0
	+ Buchireddi-					* Pilicode†	54.9	+13.2	64.7
	palam	1.3	-0.4	5.0	Mysore & Coorg.	+ Kankanady	30.6	-9.6	38.1
	Madras	0.7	-1.2	3.6		Chitaldrug	2.3	-0.3	11.4
	+ Palur	0.5	-1.1	7.1		Bangalore	4.5	+1.6	12.2
	+ Tindivanam	1.4	-0.7	4.1		Mysore	3.7	+1.2	15.0
	* Tirurkuppam	1.3	-1.0	4.1		Mercara	24.5	-1.0	35.8
	Cuddalore	1.0	-0.4	4.7		Kodaikanal	5.3	+1.1	23.9
	Vellore	1.2	-1.6	5.9		+ Coonoor	1.5	-2.2	19.8
	+ Gudiyattam	1.1	-0.9	5.3		+ Ootacamund	6.2	+0.8	18.6
	Salem	3.0	-0.1	10.0		+ Nanjanad	19.7	+12.9	35.6
Central.	Coimbatore	2.0	+0.5	6.3					
	Coimbatore, A.C.R.I.	2.1	+0.5	8.3					

- Note:— (1) † Meteorological stations of the Madras Agricultural Department.
 (2) Average of ten years data is taken as the normal.
 (3) * Average of 5 years in Tirurkuppam, and Anantharajupet and six years in Pilicode.
 (4) ** Taluk office rainfall being 2.01".
 (5) ... Data not available.

WEATHER REVIEW FOR JUNE 1948

The western disturbance, which occurred over the East Punjab on the last day of the previous month, passed away the next day across the Western Himalayas, probably inducing a secondary low over the West Punjab and the adjoining parts of North Rajputana.

On 2-6-1948, the monsoon was strong in South East Bay of Bengal and the adjoining parts of the Andaman Sea and East Central Bay of Bengal. Conditions became unsettled in the West Central Bay of Bengal off the Circars Coast. A fresh advance was also noted in the South East Arabian Sea south of Lat. 11° N.

On 11-6-1948, actually the monsoon broke out in Malabar where localised heavy rains occurred. Associated with the advance of the monsoon conditions remained unsettled in the East Arabian Sea off North Malabar and Kanara Coasts. On 15-6-1948, the monsoon extended into West Central India, the West Central Provinces, Berar and probably also in the Eastern Pakistan. The very next day the monsoon became vigorous and advanced into Assam. After a temporary lull of three days, monsoon again became vigorous in Malabar. On 22-6-1948, it advanced into West Bengal as a weak current. Four days hence it advanced into Chota Nagpur, South Bihar and the adjoining districts of the East United Provinces.

Summary of Monsoon Forecast for 1948-

In view of the conflict between some of the factors all that can be said this year is that there is a four to one chance that the total monsoon rainfall of June to September will be between 82% and 111% of the normal in the Peninsula, between 76% and 128% of the normal in North-West India and between 90% and 110% of the normal in North-East India.

Temperature.

Cocanada recorded the highest maximum temperature of 114° F. on (1, 3 & 5)-6-1948.

Weather Report for the Meteorological Observatories at the Agricultural College and Research Institute and Cotton Breeding Station at Coimbatore for the Month of June 1948.

Report No. 4/48	Observatories at	
	A. C. & R. I.	Cotton Breeding Station.
	(0822 hours)	(0722 hours)
Absolute Maximum in shade	98.2° F	100.4° F
Absolute Minimum	71.2° F	70.8° F
Mean Maximum in shade	88.4° F	89.4° F
Departure from normal	-0.6° F	-0.5° F
Mean Minimum in shade	73.1° F	73.3° F
Departure from normal	-0.3° F	+0.4° F
Total rainfall for the month	2.1"	2.3"
Departure from normal	+0.5"	+0.4"
Heaviest fall in 24 hours	0.8"	0.8"
Total number of rainy days	6	7
Mean daily wind velocity	4.97 miles per hour	6.10 miles per hour
Departure from normal	+0.07 "	-0.80 "
Mean Humidity at 8 hours	77.0 %	76.0 %
Departure from normal	+8.3 %	+4.5 %

SUMMARY.

Though the rain received was only slightly in excess over the normal, the weather was pleasant practically throughout the month. Further, the weather was fairly windy.

M. B. V. N. and C. B. M.

DEPARTMENTAL NOTIFICATIONS.

GAZETTED SERVICE—POSTING AND TRANSFERS.

Name of Officers	From	To
Sri. D. Viswanatha Reddy,	J. L. A., & Asst. Supdt. C. F., Coimbatore.	Marketing Officer, Cuddapah.
" P. A. Venkateswara Iyer,	Gazetted Asst. in Agrl., Coimbatore,	J. L. A., & Asst. Supdt. C. F., Coimbatore.
" S. R. Srinivasa Ayyangar,	D. A. O., Tanjore,	Gazetted Asst. in Agriculture, Coimbatore.
Dr. Kasinatha Iyer,	Asst. Agrl. Chemist, Coimbatore, (on leave),	Asst. Agricultural, Chemist, Coimbatore.
Sri. T. Gopalan Nair,	Asst. Curator, Ooty,	Asst. Fruit Specialist, Coonoor.
" S. Madhawa Rao,	Asst. F. S., Kodur,	Asst. Curator, Ooty.
" V. Narasinga Rao,	Asst. F. S., Coonoor,	Asst. F. S. Madras.
" P. Govinda Kutty Kurup,	Supdt. (on leave),	Wynad Colonisation, Scheme.

APPOINTMENT.

Sri. U. Achuthawariar, Asst. in Millets Coimbatore is appointed to act as gazetted Superintendent A. R. S., Koilpatti.

LEAVE.

Name of Officers	Period of leave
Sri. M. Chinaswamy Naidu, Dy. D. A., Tungabhadra Project, Bellary,	L. A. P., for 4 months from 1-7-48,

SUBORDINATE SERVICES.
POSTINGS AND TRANSFERS.

Names of Officers	From	To
Sri. M. Subba Reddy,	A. D., (on leave),	A. D., Gudur.
" V. A. Achyutam Pantulu,	Asst. A. D. (on leave),	Teaching Asst. in Agriculture, Agricultural College, Coimbatore.
" K. V. Seshagiri Rao,	A. D., (on leave),	
" P. S. Anantachari,	A. D., Peraurni,	A. D. Madurantakam.
" C. Raman Moosad,	A. D., Calicut,	P. A. to D. A. O., Calicut.
" K. Rangaswamy Iyengar,	A. D., Venkatagiri,	P. A. to D. A. O., Chittoor.
" G. V. Raghavulu,	Marketing Asst. Bezwada,	A. D. Bapatla.
" K. Moorthi Raju,	A. D., Kanigiri,	A. D., Kaudakur.

Name of Officers	From	To
Sri. M. Ramalingam,	A. D., Podili,	A. D. Darsi.
„ P. Ramakrishna Rao,	A. D., Darsi,	A. D., Kanigiri.
Janab Ali Md. Fasuuddin,	A. D., Udayagiri,	A. D., Kovur.
Sri. S. Rama Rao,	A. D., Kavali,	A. D., Udayagiri.
„ P. Balasubramaniam,		Asst. in Fruits at Madras.
„ I. K. Sambasiva Rao,	Nursery Asst. Kodur,	Asst. in Charage Kallar & Burliar, Gardens.
Janab K. Fazhulla Khan Sahib,	Asst. in Charge Kallar & Burliar, Gardens.	Horticultural Instructor, Madras.
Sri. M. Hanumantha Rao,	Fruit Asst. A. R. S., Kodur,	Nursery Asst. Kodur.
„ T. Sankaran Unni,	A. D., Bhavani,	Wynad, as Asst. for Conducting Experimental trials on exotic Plants.
„ K. Ramaswamy,	A. D., Coimbatore,	Teaching Asst. Agriculture, Coimbatore.
„ S. Ramamurthi (new),		A. D., Gooty.
„ A. Adivi Reddy,	A. D., Rayachotti,	Undergo training in Entomology and Mycology at Coimbatore.
„ B. S. Narasimha Iyer,	Plant Quarantine Inspector, Mettupalayam,	Asst. Cardamum Scheme, Singampatti.
„ M. Krishnaswamy Iyengar,	Asst. F. M., (on leave),	Asst. A. D., Rayachotti.
„ B. Venkataswamy,	A. D., Gobi,	Training in Mycology, Coimbatore.
„ M. V. Baskara Rao,	A. D., Polavaram,	A. R. S., Guntur for Improvement of Chillies.
„ S. M. Sankara Rao,	Asst. in Entomology,	A. D., Puthur.
„ G. V. Babu Rao,	A. D., Coimbatore.	Asst. in Entomology, Coimbatore.
„ N. Ramaswamy (new),		A. D., Coimbatore.
„ N. Sobhanadri,	P. A. to D. A. O., Kistna	A. D., Cuddappah.
„ V. Narasimhan,	A. D., Cuddappah,	A. D., Tanku.
„ P. V. Sambasiva Rao,	A. D., Tannku,	A. D., Polavaram.
„ T. V. Palaniswamy,	F. M., A. R. S., Nanganad,	A. D., Gudalur.
„ N. Raghavan,	A. D., Gudalur,	F. M., A. R. S., Nanjanad.
„ H. Muddaona Shetty,	A. D., Puthur,	A. D., Hospet.
„ D. Srinivasa Rao,	A. D., Hospet,	Asst. in Pulses, Coimbatore.
„ E. R. Chellm Vincent,	A. D., (on leave),	A. D., Kulitalai.
„ A. R. Krishnamurthi,	A. D., Kulitalai,	F. M., A. R. S., Palur.
„ C. Vengu,	F. M., A. R. S., Palur,	A. D., Gudiyattam.
„ C. R. Trivengadam,	A. D., Gudiyattam,	Asst. in Pulses, Coimbatore.
„ D. V. Ramana Rao,	Asst. in Pulses Coimbatore,	F. M., A. R. S., Anakapalli.
„ A. Rama Mohan Rao,	F. M., A. R. S. Anakapalli,	F. M., Agri College Bapatla.
„ Md. Zainulabdeen,	F. M., Agricultural College,	A. D., Vegetables, Madras.
„ V. S. Rangachari,	A. D., Vegetables,	Horticultural Instructor, Madras.
„ K. P. Kuppuswamy,	F. M., Botanical Gardens, Ootacamund,	F. M., Simms Park, Coonoor.
„ K. Rama Mohan Rao,	(on leave),	F. M., Hagari.

Name of Officers	From	To
Sri. A. Radhakrishna Reddy,	City Vegetable Scheme, Madras,	Fruit Asst. A. R. S., Kodur.
„ B. Padmanabha Raju,	Asst. in Paddy A. R. S., Maruter,	A. D., Kalyandrug.
„ K. M. Narayanan,	F. M., A. R. S. Nanjanad	F. M. Botanical Gardens, Ootacamund.
„ I. L. Narasimha Rao,	F. M., Arakku Valley,	A. D., Vizayanagaram.
„ C. H. Maduram,	Asst. in Pulses, Coimbatore,	F. M. C. F., Coimbatore.
„ D. Srinivasa Gopalan,	F. M. C. F., Coimbatore.	A. D., Kalladkurichi.

LEAVE

Name of Officers	Period of leave
Sri. G. Narasimha Rao, F. M., A. R. S., Samalkot,	L. A. P. for 45 days from the date of relief.
„ S. Sitapathi Rao, A. D., Kothapeta,	L. A. P. for 2 months and 24 days from 26-8-48.
„ M. Jeevan Rao, P. A. to D. A. O., Bellary,	Earned leave for 60 days from 23-6-48.
„ K. V. Narayana Reddy, A. D. Vayalpad,	Extra ordinary leave for 60 days from 4-6-48.
„ K. Ranga Rao, A. D., Bapatla,	Earned leave for 45 days on M. C. from the date of relief.
„ P. Satyanarayana, Asst. A. D., Anakapalle.	L. A. P. for 2 months from the date of relief.
„ P. K. Parameswara Menon, P. A. to D. A. O. Chittor,	L. A. P. for 3 months, from 18-8-48.
„ R. Ananda Padmanabha Pillai,	L. A. P. for 2 months from the date of relief.
„ R. Subramaniam, A. D. Tangore,	Earned leave on M. C. for 60 days from the date of relief.
„ G. Ranganathaswamy, A. D., Kalyandrug.	L. A. P. for 2 months on M. C.
„ R. Subbiah Pillai, A. D., Srivaikuntam,	Extension of unearned leave for 60 days from 4-7-48.
„ M. K. Lingaiah F. M., A. R. S., Wellington,	Earned leave for 60 days from 5-7-48.





*We apologise
for keeping you
waiting.*

Apart from the question of 'quotas' and raw materials, it takes a long time to make a Favre-Leuba watch - because, each watch must be the perfection of true craftsmanship. So we are sorry to keep you waiting, but be patient and one day you can be the proud possessor of a watch by Favre-Leuba

FAVRE-LEUBA

FAVRE-LEUBA & COMPANY, LIMITED ★ BOMBAY ★ CALCUTTA

Edited and Published by D. Viswanatha Reddy for The Madras Agricultural
Students' Union and Printed by A. Subramaniam, at The Coimbatore Co-operative
Press Works, Limited, Coimbatore.