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EDITORIAL

The War and Fertilizers in India. In the January number of the 'Indian Farming', Mr. David Hendry discusses the effect of War on the use of fertilizers in India. The problem was not present during the last war, owing to the very limited use of artificial fertilizers by the Indian cultivator. But in recent years, on account of the lowering of prices of the inorganic manures rendered possible by the improvements effected in the manufacturing processes, the use of artificial manures, especially nitrogenous manures has increased to an enormous extent and more than 100,000 tons of sulphate of ammonia are consumed per annum. Of this quantity, only 19,000 tons are produced in this country, and the restriction placed in the export of sulphate of ammonia from the United Kingdom as a consequence of war, has therefore created a problem to the Indian cultivator, especially in Madras which is a 'fertilizer minded' province. The problem has to be solved either (1) by restriction in the use of the fertilizers to the quantity available in India, or (2) by increasing the out-put in this country. It is possible to some extent to restrict the use of artificials and supplement the nitrogen requirements by the application of oil cakes and fuller utilisation of farm yard manure, compost and green manure, in the case of crops like paddy, where the margin of profit to the cultivator is very narrow, but in the case of valuable money crops, like tea, sugarcane and potatoes, however, there is no doubt that crop production will be adversely affected if sufficient quantities of inorganic nitrogenous and phosphatic manures are not available at a reasonable cost. It is therefore necessary, that efforts should be made to increase our output to meet our demands, and we are glad to learn in this connection that the manufacture of sulphate of ammonia on a large scale has been taken up in Mysore and Mettur. The utilisation of the crude mineral phosphate available in certain parts of South India for the manufacture of super-phosphates, will, also we hope, receive the attention, it deserves from those interested in the development of the manure industry in this province.

Hostel Tatler. We have great pleasure in presenting to our readers, along with this number the students' supplement of the Madras Agricultural Journal. The students of the college have been for some years conducting a manuscript journal of their own, under the title 'The Hostel Tatler', and it was felt that the contributions in that Journal may provide, amusement to others besides the present students of the college-especially the old boys of the college in the mofussil. The publication of the supplement, has been rendered possible by the generous offer of the students to defray part of the cost of production and we have no doubt that their enthusiasm will be rewarded by the grateful appreciation of the readers of the Madras Agricultural Journal. The supplement reveals the existence of a considerable amount of artistic skill, orignality and literary talent in our students, which deserve encouragement.

Our heartiest good wishes to the success of the 'Hostel Tatler.'

Orchard Efficiency Analysis in Mangoes (*Mangifera Indica* Linn.) and Oranges (*C. Sinensis* Osbeck)

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Introduction. The Presidency of Madras is reputed to be one of the leading producing centres of mangoes and sweet oranges. According to the latest figures (2) the province claims an area of 244,945 acres under mangoes with a marketable production of 20,000,000 railway maunds of fresh fruits, of which 400,000 railway maunds are exported annually to other parts of India. Although the sweet oranges comprising mainly of two commercial varieties viz., the Sathgudi and Batavian account to-gether at present for a production of 195,000 railway maunds, about 65% of the orchards under these two varieties are yet young and have not reached the bearing stage.

An outstanding feature of the mango production in this part of India is that, it is not the result of a few standard commercial varieties but of a vast number of distinct horticultural entities, many of which constitute nothing more than mere local curiosities. In the Ceded districts, although a very large number of varieties are under cultivation, those that are extensively grown, are Neelum, Bangalora, Mulgoa, Andrews, Baneshan, Khader and Peter. It is gradually being recognised that efficiency of production and marketing requires that the orchards should be stocked with a limited number of economically profitable varieties instead of the prevailing multiplicity of varying forms and types of good or indifferent value. Information on the commercial value of each of the various varieties is, therefore, being increasingly sought for, especially for the raising of new plantations.

In the case of sweet orange plantations, however, seed propagation has been the rule in South India till very recently. It is in the very nature of seed propagation, that the plants raised become extremely variable, so much so that it is found impossible to obtain a standardised crop from any single plantation. The promiscuous crossing that takes place in nature between conjugally compatible varieties and species of citrus, have led to the origin of numerous and varied types and forms, so that the efficiency of orange production is found to be fast undergoing a process of quality deterioration. However, the polyembryonic nature of sweet orange (6) and the consequent origin of large number of apogamic seedlings identical to the seed parent has possibly served as a check in this down-ward march of the South Indian orange industry.

Hodgson (3) has pointed out that the factors governing successful production of fruits of any of the varieties depend primarily upon the environment, cultural practices and inherent character of the trees. In a crop like mango, which hardly receives any cultural attention in the Ceded districts after the trees attain the bearing stage, and which does not seem to afford much scope for improvement of cultural pratices at the present stage of low

orchard returns, the possible improvements that can be effected appear to lie primarily in the direction of stocking the orchards with inherently highly productive and choice fruiting trees of economically profitable varieties. Such a step will also be obviously necessary in the case of sweet orange plantations, especially in view of the very wide variation in orchard returns from plantations located under apparently identical conditions.

As a means of visualising the relationship between orchard productivity and inherent bearing capacity of the trees and varieties, separate investigations dealing with mangoes and sweet oranges were initiated at the Fruit Research Station, Kodur, during 1936 and 1937, respectively. The results presented in this paper relate to the data collected for these investigations during the period of four years in the case of mangoes and three years in the case of sweet oranges.

Materials and Methods. A private mango grove at Kodur covering an area of about 50 acres and containing 1632 bearing trees of 25 different varieties was selected for one of these investigations. For the study with sweet oranges, two separate sathgudi (syn. chinee orange) orchards, close to the Fruit Research Station, Kodur and located at a distance of about 440 yards from each other, and consisting of 212 and 102 seedling trees respectively of uniform age and in full bearing condition were selected. The former orchard has been designated as No. 1 and the latter as No. 2 in this paper.

The performance records of individual trees in these three plantations were estimated according to the lines suggested by Hodgson (3). Briefly, for the purpose of recording data and analysis of the results the system adopted consisted of the arbitrary fixing of four classes of trees according to relative production, taking the normal full crop for the year as the standard. The numerals 1, 2, 3, and 4 were used to designate heavy, medium, poor and no crop-production respectively. In the case of mangoes estimates of flower production in the case of each tree were also made and recorded similarly.

Since a number of trees in the mango plantation consisted of weak or diseased individuals, it was felt necessary to include for the purpose of analysis only such trees as were of apparently uniform vigour and growing as close together as possible in compact areas. In all, 434 Neelum trees in 5 separate plots, 630 Bangalora trees also in 5 different plots, 41 trees of Andrews variety in one plot and 38 Mulgoa trees in yet another plot were finally selected for the purpose of analysis. The specimen records from a Bangalora Block plot are given in Fig. I. Such a necessity for selective analysis was not felt in sweet orange plantations, as almost all the trees were very uniform in vigour and health.

In presenting the data in this paper, the performance of the first and the last class of trees have only been taken into account. This restriction is expected to reduce the error in estimation of performance due to personal factor, to the narrowest limits possible.

Performance Record Chart of Bangalora Block-Y-C. R. Garden, Kodur 1936–39.

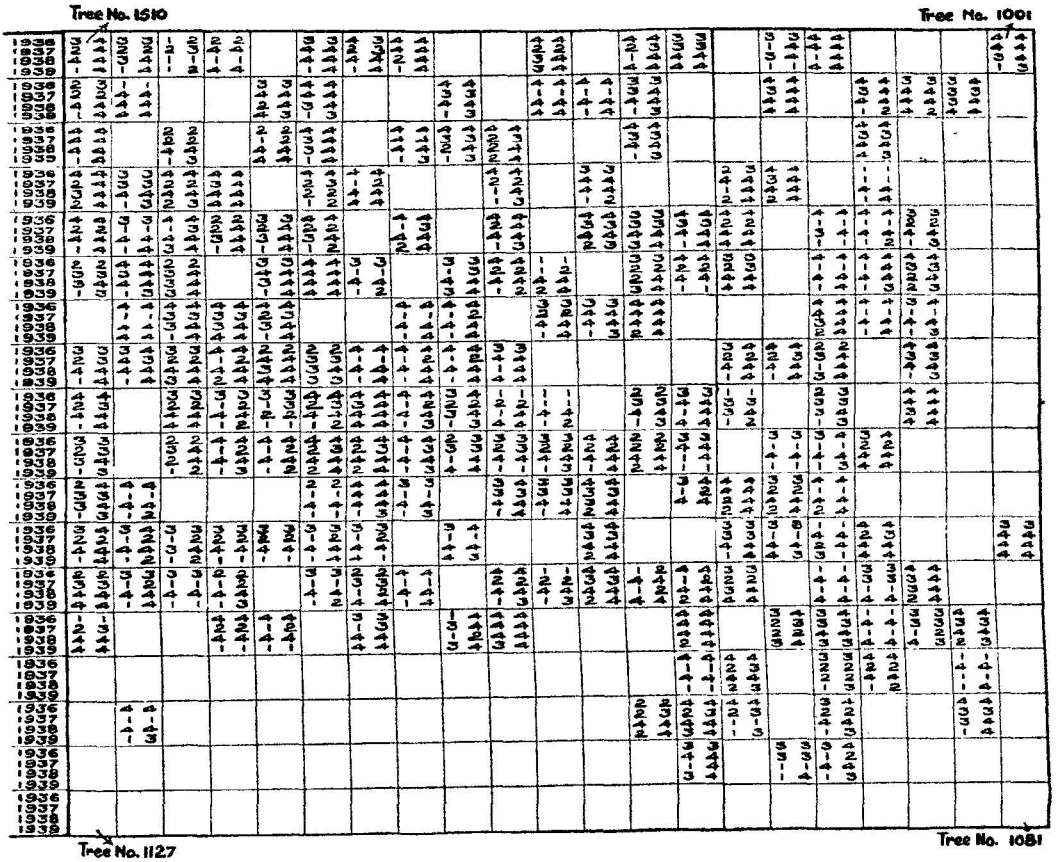

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Figure I.

1. Heavy flowering or fruiting. 2. Medium. 3. Poor. 4. Very poor no flowering or fruiting.

Note. 1. The left hand figures in each square indicates estimated flower records, while the figures on the right stand for estimated fruit yield records for the same tree in that square for the year.

The sathgudi orange is, however, known to bear two main crops regularly in a year in this tract. This feature has rendered necessary to estimate the performance of trees selected for these studies at two different periods of the year, and analyse these data separately for each crop.

Data and Discussion of Results.

1. **Mango performance records.** In statement No. 1 are given the percentages of poor and heavy flowering trees in each of the four varieties under study during 1936–39.

It is seen from the above figures that on the basis of flowering, the percentage of profitable trees has not exceeded in any year 11·7 in Neelum, 49·0 in Bangalora, 14·6 in Andrews and 42·1 in Mulgoa. On the other hand, the percentage of poor flowering trees has been as high as 74·8 in Neelum, 80·2 in Bangalora, 90·3 in Andrews and 93·7 in Mulgoa.

Statement 1. Showing the percentages of poor and heavy flowering trees of 4 varieties of graft mangoes at Kodur. 1936—1939.

Total number of tress: {Neelum=434, Bangalora=630, Andrews=41, Mulgoa=38.

Particulars.	1936				1937				1938				1939			
	Neelam.	Bangalora.	Andrews.	Mulgoa.	Neelum.	Bangalora	Andrews.	Mulgoa.	Neelum.	Bangalora.	Andrews.	Mulgoa.	Neelum.	Bangalora.	Andrews.	Mulgoa.
Percentage of poor-bearing trees	60·6	74·3	90·2	79·0	58.3	43·2	78·8	52·7	70·6	80·2	90·3	93·7	74·8	35·0	66·4	39·5
Percentage of heavy-bearing trees	9·9	8·6	4·9	2·6	15·2	27·8	14·6	10·5	11·7	12·5	2.4	nil	6·4	49 0	9·7	42·1

Statement 2. Showing percentages of low, and heavy fruting trees of Neelum, Bangalora, Andrews and Mulgoa trees during 1936--39.

Total number of trees: {Neelum=434, Bangalora=630, Andrews=41, Mulgoa=38.

Particulars.	1936				1937				1938				1939			
	Neelum.	Bangalora.	Andrews.	Mulgoa.	Neelum.	Bangalora.	Andrews.	Mulgoa.	Neelum	Bangalora.	Andrews.	Mulgoa.	Neelum.	Bangalora.	Andrews.	Mulgoa.
Percentage of poor-bearing trees	63·8	75·7	90·31	87·0	76·7	62·0	90·8	100·0	84·0	92·4	9·5	100·0	32·00	78·0	100·0	100·0
Percentage of heavy-bearing trees	9.0	7·9	2·4	2·6	3·1	9·0	nil	nil	7·1	5·0	2·4	nil	3·2	2·0	nil	nil

When the data relating to the estimated yield of fruits are similarly analysed, the low percentage of heavy bearing trees in the plantation is brought out more prominently, as is evident from statement No. 2.

The above figures show that the maximum percentage of heavy-yielding trees during the four-year period has been only 9·0 in Neelum and Bangalora, 2·4 in Andrews and 2·6 in Mulgoa, whereas the maximum percentage of poor-yielding trees has been 84·0 in Neelum, 92·4 in Bangalora and 100. 0 in Andrews and Mulgoa. An amazingly high presentage of unprofitable trees seems, therefore, a common feature in these four varieties of commercial importance in this tract.

The above data does not, however, represent an accurate picture of the relative economic importance of any ot the four varieties, nor does it indicate the manner in which the varieties react to the popularly believed phenomenon of biennial or periodic bearing in mangoes. For this purpose the data have been analysed separately with a view to trace the performance of each individual tree of all the four varieties during the four-year period. This has furnished an idea of the proportion of trees in each variety that bear an uniform crop of flowers or fruits in two, three or four years during the four-year period. The summarised data are presented in Statement Nos. 3 and 4.

Statement No. 3. Showing the percentages of consistently heavy and poor flowering trees in a two-year, three-year and four-year periods.

Total number of trees ;— Neelum = 434 Bangalora = 630; Andrews = 41 Mulgoa = 38

Period	Consistently heavy-flowering				Consistently poor-flowering			
	Neelum	Bangalora	Andrews	Mulgoa	Neelum	Bangalora	Andrews	Mulgoa
Any 2- year period	6 9	25·4	4·9	5·3	89·2	65·9	95·1	89·5
Any 3-year period	0·2	2·1	2·4	nil	53·9	48 2	85·4	60·5
Any 4-year period	nil	0 1	nil	nil	19·6	13·9	41·4	13·2

Statement No. 4. Showing the percentages of consistently heavy and poor fruiting trees in two-year, three-year and four-year periods.

Total number of trees : Neelum = 434. Bangalora = 630. Andrews = 41. Mulgoa = 38.

Period.	Consistently heavy-fruiting.				Consistently poor-fruiting.			
	Neelum.	Bangalora.	Andrews.	Mulgoa.	Neelum.	Bangalora.	Andrews.	Mulgoa.
Any 2-year period.	3·9	3·0	2·4	nil	94·5	98·7	100·0	100·0
Any 3-year period.	0·5	nil	nil	nil	74·2	80·0	95·1	100·0
Any 4-year period.	nil	nil	nil	nil	35 5	39·5	83·0	84·2

The following inferences are warranted from the above figures:—

(i) There is not a single tree in any of the four varieties that has produced consistently heavy or medium crop of flowers consecutively in the four-year's period under study, with the solitary exception of a Bangalora tree that has consistently borne heavy crop of flowers throughout the four year period.

(ii) On the other hand, the percentage of consistently poor-flowering or fruiting trees during the four-year period has been as high as 41·4 and 83·0 respectively in Andrews, 13·2 and 84·2 respectively in Mulgoa, 13·9 and 39·5 in Bangalora and 19·6 and 35·5 in Neelum. The existence of such a high percentage of consistently non-productive trees is a serious draw-back in the orchard under study.

(iii) The inferences drawn above for the four-year period apply almost in a similar degree to the three-year period also except that in the case of fruiting in Mulgoa and Andrews, the percentages of trees that bore poor crop of fruits consistently during three out of four years have been as high as 100·0 and 95·1 respectively. This surprising fact points out the utter futility of raising commercial orchards of these two varieties in this tract.

(iv) The percentage of consistently heavy-flowering trees in any two out of the four years has been the largest in Bangalora, but this advantage has not been maintained till the fruit ripening period. In fact, the percentage of consistently heavy-fruiting trees in any two years out of the four-year period has been only 3·9 in Neelum, 3·0 in Bangalora, 2·4 in Andrews and nil in Mulgoa, while the percentage of consistently poor-fruiting trees in any two years has been as high as 94·5 in Neelum 98·7 in Bangalora and 100·0 in Mulgoa and Andrews.

The above facts clearly indicate that, one of the most important lines of improvement that requires to be effected in the mango industry in this tract is to increase the proportion of consistently productive individuals. Whether this can be brought about by propagation of plants from selected parents of inherently heavy-yielding capacities or by hybridization are questions that merit serious consideration in preference to the improvements that can possibly be effected through orchard cultural practices

That Mulgoa and Andrews are not commercially profitable varieties in this tract has been clearly brought out from these studies. In a separate series of investigations not reported herein, it has been found that Neelum and Bangalora possess the longest marketing season and Mulgoa has a very low percentage of perfect flowers in the panicle, which results in its shy-bearing habit. A study of the prices realised by some of the important varieties during a period of six years (1931—1936) has also revealed that, as against an average of Rs. 6 per basket received for Mulgoa and Andrews during the height of the season, Neelum commands a price of as much as Rs. 10 per basket towards the close of the season, when fruits of the above varieties are scarce, even though during the mid-season the price may range from Rs. 1—8—0 to Rs. 3 per basket. The relatively higher and regular bearing tendency of Neelum, its longer marketing season, its ability to command fancy prices at the fag end of the season and also its frequent production of a fair-sized off-season crop of high marketing value marks out

this variety as the most suitable for commercial planting in this tract, even though its quality is inferior to that of Mulgoa and Andrews. Between Bangalora and Neelum, the latter commends itself more to the growers, because of its better fruit quality and its frequent habit of production of off-season crops.

With a view to gather some information about the possible effect of a heavy or poor crop in one season on the yield in the following seasons, the estimated yield records were further analysed separately for each variety. These revealed that, in the case of Neelum, for every 100 trees that bore heavy crops of fruits in 1936, only eight trees bore heavy yields in 1937, ten trees in 1938 and 13 trees in 1939. This shows that the possible exhaustion effect caused during 1936, had not been made up during the following three years. It further shows that, the popular conception of an off-year following alternately an on-year is not substantiated. Similarly, when the performance of the poor-bearing Neelum trees are traced, it is found that, of the 100 such trees in 1936, 78 in 1937, 87 in 1938 and 81 in 1939 continued to bear poor crops. In the same manner, out of 100 trees that bore heavy crops in 1936 in Bangalora, only ten in 1937 and 1938 and six in 1939 bore heavy crops, while of the 100 trees that bore poor crops in this variety in 1936, 62 in 1937, 94 in 1938 and 88 in 1939 continued to bear poor yields. All these facts seem to conclusively support the previously recorded inference that, in a given tree an on-year does not necessarily follow an off-year. In other words, the bearing in mangoes seems to be governed not entirely by the performance of the trees in the previous year nor by the supposedly existing phenomenon of biennial bearing, but mainly by the inherent character of the individual tree, including possibly parts thereof, and also by other environmental factors including the incidence of pests and diseases and cultural practices.

Orange performance records. It has been stated previously that sathgudi orange bears two main crops in a year in Ceded districts, but it often happens that irregular blooming periods also get intercalated between these two main periods, resulting in the availability of fruits practically throughout the year. The blooming period for the winter crop, which forms the largest bulk of the produce varies slightly from season to season, having occurred during the last three weeks of February in 1937 and 1938 and last week of January in 1939. The harvest of this chief crop of the year was done during December-January in 1936-37, November-March in 1937-38 and November-January in 1938-39. For the second crop, flowering has occurred from last week of September to the beginning of December, and harvest was done from June to August during the period under study. Prevailing prices in the market offer an inducement to the growers to pick immature fruits, while in some years premature harvest is necessitated by the attack of fruit moth, *Ophideres*. These factors are also expected to affect the tree yield not only during the season but also in the immediately succeeding one.

Unlike in the case of studies in mango orchards, it has been possible to take an actual count of the fruits borne on each individual tree in the two sathgudi plantations. Besides furnishing a more accurate standard for the grouping of the trees into heavy and low bearers, the above method has also shown an indication of the relation between the tree yields in the two bearing seasons. In the following statements are presented the information gathered from these two orchards during the first two years viz., 1936-37 and 1937-38 as also a summary of the compiled information collected during the entire 3-year period.

Statement No. 5. Summary of information gathered from Orange Orchard analysis.

Particulars	Garden No. 1		Garden No. 2	
	1936—37	1937—38	1936—37	1937—38
1. Percentage of non-bearing trees and trees bearing less than 50 fruits each.	23·6	7·2	52·9	25·2
2. Average number of fruits per tree for the year.	135·8	557·43	66·10	300·7
3. Average number of fruits per bearing tree in 1st season.	156·3	529·0	90·9	297·0
4. Average number of fruits per bearing tree in 2nd season.	28·5	20·8	35·7	6·5
5. Average number of fruits per bearing tree for the whole year.	154·8	565 63	84·4	329·8
6. Maximum yield per tree in 1st season.	935	1400	320	1200
7. Maximum yield per tree in 2nd season.	150	95	200	40

Statement No. 6. Showing the orchard efficiency analysis during 1936—39.

Season of bearing	Garden No. 1		Garden No. 2	
	Heavy bearers %	Low or No bearers %	Heavy bearers %	Low or No bearers %
1st season	17·48	12·62	19·80	30 21
2nd season	16·50	59·71	37·50	39·50

The above data make it clear that, from the point of view of gross crop yield, garden No. 1 has proved to be a distinctly more valuable asset than garden No. 2. This difference is primarily due to the existence of a larger percentage of non-bearing or low-producing trees in the first season and also due to a relatively lower tree yield in that season in the latter garden than in the former. Although garden No. 2 has shown during the 3 year period to possess a higher proportion of high yielding individuals, especially

of the class that bears the second season crop, this advantage has been offset by the other unfavourable features mentioned above.

While the size of crop per tree or garden or season is clearly subject to considerable variation the ratio between the yields of the two seasons continues to be very wide, so that the second crop forms but a very small part of the gross yield in the year. This, however, does not detract the economic value of the second crop, which usually sells at a rate thrice or four times of that realised for the fruits of the first crop.

It seems clear from the orchard effeciency data for the three-year period that, unlike in mangoes the consistently poor or low-yielding trees in sathgudi orange plantation form a small proportion, not exceeding 30·21% in the first season and 59·71% in the second season. Garden No. 1, which is reputed to be one of the most profitable in this tract possesses only 12·62% of the trees that are consistently unprofitable on the basis of the yield records of the first season. The analysed figures of cropping furnished for three typical sweet orange plantations by Hodgson (3) have shown that the percentage of unprofitable trees range from 13 to 32, while in the average orchard the percentage may be over 50. Judged by this standard, it seems that the best seedling orange groves of the Ceded districts can favourably compare with the best budded orange plantations in California. On the other hand, the percentage of profitable or heavy-yielding trees in California has been found by Hodgson to vary from 26 to 68, while in Philippines, the percentage of such trees has been found to range between 2·94 to 51·28 in the four Batangas mandarin groves (4). Notwithstanding the possible differences in the grouping of trees according to yields as adopted in California and Philippines, an inference that seems valid is that, there is scope in this tract for increasing the orchard yields by increasing the number of inherently high yielding trees.

Webber (5) and Batchelor and his co-workers (1) have shown that the variations in orange tree yield is likely to be considerably influenced by the variations inherent in the buds due to heritage. Even if it be true that, orchard environment may be more potent than genetic factors in influencing productivity (4), the value of selecting only such trees as have been raised from high-yielding individuals seems well established for ensuring maximum productivity. Since seed propagation in citrus, despite its polyembryonic character cannot be depended upon to produce every progeny true to the parents, such selection of budlings from high-yielding parents is only possible through vegetative propagation, especially through budding, which is the most economic of the latter methods.

Vegetative propagation is known to be specially valuable in mangoes, because of the mono-embryonic character of most of the Indian varieties. The continued and extensive recourse to this method through ages has however, not increased the proportion of inherently productive individual trees, possibly because of the lack of any selective process in the parent

material. Because of the alleged phenomenon of 'periodicity of bearing' in mangoes, it may also be impracticable to secure as high a proportion of consistently productive parent trees in a mango grove as in citrus.

Nevertheless, from the economic view-point of the grower, the most important measure that requires to be devised appears to be that, which has as its objective a definite increase in the orchard effeciency. Rigorous selection of parent material, control of the so-called phenomenon of 'periodicity of bearing', or employing suitable rootstocks are some of the possible methods that can be adopted towards the realisation of these objectives. On the other hand, in the case of sathgudi orange, while the value of selection of parents cannot be denied, the greater importance of cultural propagation and rootstock investigations appears to be indicated to enhance the orchard receipts through better fruit quality, disease resistance and an increased productivity in the medium or low-cropping individuals.

It also appears that the simple method of orchard analysis adopted in these investigations will be most useful in evaluating the intrinsic orchard value. It would thus furnish a more efficient means to the purchaser of a bearing orchard of determining the orchard value than any of the prevailing methods.

Summary. 1. An amazingly high percentage of unprofitable trees has been found to form a common feature in Neelum, Bangalora, Andrews and Mulgoa varieties of mango in the Ceded districts.

2. Out of 1143 trees of four varieties under study, there is only a single tree of Bangalora variety, which has consistently borne heavy crop of flowers during the four-year period. Not a single tree in any of the four varieties has produced heavy or medium crop of fruits consistently during this period.

3. Since over 95 % of the trees of Mulgoa and Andrew have borne consistently poor or no crop during the 3 out of our years under study, and since the percentage of heavy fruiting trees in any one year has not exceeded 2·6, it appears futile to include these varieties in commercial plantations.

4. Neelum has proved to be the most economically profitable variety in this region.

5. The popular conception that an off-year is invariably followed by an on-year or *vice versa* is not substantiated.

6. The orange garden No. 1 has proved to be a distinctly more valuable set than No. 2.

7. While the possibility of increasing the number of heavy-yielding trees by vegetative propagation and selection of parent material is indicated, increasing of yields of medium and low croppers are found to be of greater importance in oranges, unlike in mango orchards.

8. The simple method of orchard analysis adopted in these investigations is likely to offer an efficient means to the purchaser of a bearing plantation of determining the intrinsic value of the trees grown therein.

Acknowledgment. Thanks are due to Messrs. P. Parthasarathy, C. Bhujanga Rao, G. Venkatakrishnan and S. Mahadeva Iyer for their assistance in collecting the data at different stages during the period of their training at the Fruit Research Station, and to Messrs. P. Changal Reddy, B. Jayaramaiah and B. Seetharamaiah for affording facilities to collect data in their respective orchards.

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A Reply to Critics

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The activities of the Agricultural Department, are often subject to criticism, in the press, on the platform, and also in the legislative chambers. The object of this note is to meet those criticisms by explaining the handicaps which the Departmental staff have to face in the course of execution of their duties. Before proceeding to examine the most common criticisms levelled against the Department, it seems desirable to place before the reader an idea of the number of officers employed and their jurisdiction, to enable him to realise the nature of such handicaps and judge for himself whether the criticisms are justified or not.

The Department, as at present constituted, has two main functions to perform viz., *Research* and *Propaganda*. The activities of the research side are confined to the Agricultural Research Institute located at Coimbatore and also at different farms situated all over the presidency. For the purpose of propaganda, the presidency is divided into four circles and in each circle a technically trained officer styled as Agricultural Demonstrator is placed in charge of one taluk.

It may be safely assumed, that in this Presidency, each taluk on an average comprises about 150 villages and as already pointed out, all these villages will be in charge of one Demonstrator who will be assisted by two skilled coolies. It is impossible for a single individual to cover this wide area, extending on a modest estimate over 300 square miles and tackle all the ryots who will easily number a few thousands. The criticisms one often hears or reads of, are (a) the Agricultural Demonstrator is not to be seen, (b) the existence of the Agricultural Department is not known to the ryots, (c) the Agricultural Department has done next to nothing, (d) the recommendations of the Agricultural Department are too costly for an average ryot to adopt and (e) the money spent on the Agricultural Department is not commensurate with the benefits derived by the ryots.

(a) *The Agricultural Demonstrator is not to be seen.* Prior to 1931, the method of propaganda in vogue was, the Demonstrator was allowed to tackle as many ryots as possible all over the taluk. Tha result was the jurisdiction being so wide, the ryots could not be frequently met and consequently there was no continuity in the work started in any one place. In order to rectify these defects and with a view to concentrate the work which is essential for the introduction of improvements, the policy was changed.

In accordance with the present policy, each Demonstrator is expected to select eight villages, on the basis of one village for each *firka* in the taluk, and concentrate work not only in those villages styled as "central villages" but also in the surrounding villages situated within a radius of

about five miles. The number of villages now tackled will be about 50 for each taluk. The work is concentrated in those eight groups of villages for a period of three to five years and then a fresh batch of villages are tackled. In addition to the work carried on in those fifty villages, if any calls are received from other villages in the taluk, the Demonstrator is expected to attend to them.

On the basis of the present policy it will take about 15 to 25 years to tackle all the villages in each taluk. It has often been the experience of workers in rural reconstruction schemes that when once the "guiding hand" is removed, things revert to the old order and therefore it is essential that there is continuity in work. The critics will do well to recognise these facts and strive to increase the strength of staff for each taluk, so that not only all the villages can be tackled at the same time, but also there can be continuity in the work which is once started.

(b) *The existence of the Agricultural Department is not known to the ryots.* People who generally make this criticism have the Revenue Department in the background as a standard for comparison. It is a fallacy to compare the Agricultural Department with the Revenue Department which has a staff in each and every village in the taluk. It is not possible for a single officer to make his presence felt all over the taluk as the table below will indicate :—

	Staff of	
	Revenue Department.	Agricultural Department.
Village.	Karnam and Munsiff.	Nil.
Firka.	Revenue Inspector.	Nil.
Taluk.	Tahsildar.	Demonstrator.
Division (Group of two to four taluks.)	Sub-Collector or Deputy Collector	Nil.
District.	Collector.	Nil except Vizagapatam. (There are 13 Assistant Directors for 25 Districts).

Sir John Russell, F. R. S., Director of the Rothamsted Experiment Station, England, who recently toured and examined the various agricultural research schemes in progress, in different parts of India financed by the Government of India, remarked in an article on "Science and the Indian Peasant", contributed to the *Journal of the Royal Society of Arts.*

"What India needs now, is not so much new scientific knowledge about general agriculture, but fuller use of existing knowledge and the working out of methods to reduce the present wide gap between the ordinary cultivator and the experimental farm".

This gap can be bridged only by increasing the staff employed on propaganda side. If this is accomplished, the critics will have earned the gratitude of thousands of ryots who are now outside the fold of the activities of the Department.

(c) *The Agricultural Department has done next to nothing.* One has to study the work done by the Department only on two major crops viz., Paddy and Sugarcane—the two important representatives of the 'subsistence' and 'money' crops, to realise the uncharitable nature of this criticism. The Department has nearly sixty strains of Paddy suitable for cultivation under different conditions. These strains are never distributed unless their yield is at least, ten per cent over that of the local variety which they are intended to replace. In addition, some of the strains fetch better price in the market than local variety due to purity of stuff, fineness of grain and other qualities. It is found impossible to arrive at, even to an approximate extent, the spread of Departmental strains in the Presidency. The demand for the seed is so great that the Departmental farms are not able to meet them and consequently the supply has to be arranged from ryots who grew them in the previous season.

In the case of sugarcane the achievement of the Department is much more spectacular. Almost the entire area in the Presidency is under varieties introduced by the Department from time to time. Many more such examples can be cited.

(d) *The recommendations of the Agricultural Department are too costly for an average ryot, to adopt.*

The economic side of any improvement advocated by the Department has always received the first consideration before introduction. The improvements advocated may be broadly classified under three groups viz, (i) Cultural—to reduce the labour bill, (ii) manurial—to increase the net profit (iii) varietal—to increase yield. There is a large demand for seeds of strains, evolved by the Department especially in the case of paddy, cotton and groundnut which the Department is finding difficult to meet.

The Loans issued by the Departmant for the purchase of implements has increased from Rs. 130 in 1931—32 to Rs. 18,188 in 1938—39. Several examples of other improvements advocated, which have been easily adopted by ryots can be cited to prove that they are not costly.

(e) *The money spent on the Agricultural Department is not commensurate with the benefits derived by the ryots.*

In this Presidency, the area under Paddy snd Sugarcane according to the season and crop Report for 1937—38 was 10,140,831 and 97,965 acres respectively. Assuming for argument's sake that the departmental paddy strains have spread only over 5 per cent of the total area (i. e.. 507041 acres) and the value of the increased yield obtained is only about Rs. 5 per acre, annual gain to ryots by growing the improved paddy strains alone will roughly be about Rs. 25,35,205.

Similarly in the case of sugarcane, a crop practically the entire area of which is under departmental varieties, the annual gain to ryots will roughly be about Rs. 48,98,250, assuming that the value of increased yield due to

cultivation of departmental varieties is about Rs. 50 per acre—a very low figure.

The annual budget grant of the Agricultural Department is Rs. 21,065,00 —much less than a modestly estimated profit from either paddy or sugarcane and that in a single item of improvement advocated in both the crops viz., growing of improved strains evolved, or introduced by the Department. Figures speak for themselves, hence no further comment is necessary.

5. It is sincerely hoped that critics of the Department will bear these facts in mind and endeavour to ' bridge the gap " as advised by Sir John Russell by enabling the Government to increase the staff on the propaganda side, which seems to be the only way to improve the lot of the peasant.

Molasses as Food.

Experiments concluded at the Massachusetts Institute of Technology show that old-fashioned molasses is about the best food known for treating nutritional anaemia, the kind of anaemia due to improper diet. *Science, Vol. 90, October 27, 1939.*

Whereas molasses has 6·1 parts of usable iron per 100,000 parts by weight, spinach has only 0·5, beef liver has 5·6 ; oatmeal 4·6 ; apricots, eggs and raisins following in that order. Usable iron was computed, not total content, for only that iron which the body can use to manufacure hemoglobin is valuable. Both chemical and biological tests on rats were used. —Science, Vol. 90, October 27, 1939.

The Late Rao Sahib T. V. Rajagopalachariar.

Rao Sahib T. V. Rajagopalachariar whose unexpected death in the early hours of the 8th instant we now mourn was born in the late seventies of the last century at Tirukkarungudi, an important Vaishnavite centre in Nanguneri taluq of the Tinnevely district. This village was always dear to his heart. It was an ancient South Indian village typical of the then existing village organization in many respects.

The late Mr. Acharya came of a very devout Sri Vaishnavite family and had his education in his own village in Palamcottah and at the S. P. G. College, Trichinopoly' With an inborn bent for agriculture, he joined the Madras College of Agriculture at Saidapet and took his Diploma in due course. As was the wont at the time he was drafted into the Revenue Department. He joined the Board of Revenue and when the expansion of the Agricultural Department gave a reorientation to the policy of the Government, he was transferred to that Department. Having served his apprenticeship in the Bombay Experimental farms for a year, he was put in charge of the Koilpatti Cotton Farm where investigations on 'Tinnies' and other allied problems were taken up. Later he was transferred to the charge of the Central Farm, Coimbatore. Subsequently he saw service in the Godavari and Kistna deltas and spent considerable time in the Ceded district, particularly at the Hagari Experimental Station.

During this period he had gained experience in the 'Hadi process' of Gur and sugar making, having been deputed by government to the United Provinces. With such varied knowledge of the conditions of the agricultural industry in Bombay, the United Provinces and Madras, he was considered eminently fit to be in charge of teaching agriculture at the Coimbatore Agricultural College which had very shortly to be affiliated to the University of Madras. He was gazetted Lecturer in Agriculture in 1920 and put in charge of teaching agriculture for B. Sc. (Ag.) students. In September 1929, he was promoted to be officiating Vice Principal in which capacity also he continued to be in charge of teaching until he retired in June 1932. In recognition of his valuable services to the cause of agriculture, Government conferred on him the title of 'Rao Sahib' in 1931.

During the period of his retirement (alas of less than eight years) he continued his active habits and was connected in various capacities with all the important organisations of the town, Theosophical, Co-operative, Humanitarian Societies like the S. P. C. A, Civic Bodies like the Rate Payers' Association, and Social Clubs. He was one of the first Directors in the now very successful City Milk Supply Union and he was always full of ambitious schemes for ameliorating the condition of his people. On the technical side he was associated with the Senate and Academic Council of the Madras University and, was, of course, a valued examiner in agriculture. By his nature and character he commanded the respect of his colleagues in all these organisations.

He was an ardent theosophist, a willing and zealous co-operator, a critic of music, a discriminating astrologer, a progressivist in social reforms, a cosmopolitan in his outlook on life, a rationalist in religion, a believer in progress, and a thorough going optimist all his life. He was affectionate to a fault, a loving father, and a good friend and guide. All through the day and particularly in the evenings his friends used to gather round him to enjoy his inspiring talks on all matters, religious, social and economic.

(T. S. V.)

College News & Notes.

Personal:—Sri. C. N. Babu, B.Sc., who was for sometime a research student in the oil seed section and was till recently an Assistant in the Imperial Sugarcane Breeding Station, Coimbatore, has been conferred the degree of M. Sc. by the University of Madras for his thesis on "Cytological studies on Cymbopogon".

We offer our hearty felicitations to Sri. C. N. Babu.

Foot and Mouth Disease. Consequent upon the recurrence of "Foot and mouth disease" in the vicinity of the Agricultural College Estate, the precautionnary and control measures, temporarily withheld by the Central Farm authorities, have been again revived. The Central Farm animals are yet free from this disease.

Visitors. Mr. G. B. Patel, Cotton Botanist, Sind was on a visit to the Agricultural College and Research Institute during the last week of February. He addressed the Association of Economic Biologists on "Breeding of the Cotton in Guzrat".

Season and Water Scarcity. Very dry and hot weather is being experienced at Coimbatore at present. The absence of rains for the last 5 months has seriously affected the supply of water in almost all the wells in the District and the Coimbatore Municipality have taken advance precautionary measures by regulating supply of water, to guard against serious shortage in summer.

Mofussil News and Notes.

Karkala:—Cattle Fair at Sitanadi in Karkala Taluk of South Kanara District. For the benefit of the cultivators of Karkala, Udipi and Coondapoor taluks in the South Kanara district of the Madras Province, a cattle fair is being conducted at Sitanadi by the Cattle Fair Committee of Hebri under the auspices of the South Kanara District Board. The first fair was held in the year 1937. This fair lasts for about ten days just a week after the cattle fair at Kulkunda near Subramannya in Puttur taluk about 90 miles away, which is held about the third week of November every year. The Sitanadi cattle fair is held in the village of Hebri almost at the foot of the Agumbe ghat and provides good camping ground for cattle as well as sufficient pasturage and drinking water. Cattle of all classes are brought down from the Mysore State for sale. The following is the number of cattle that assembled at Sitanadi in December 1939.

Particulars of cattle.	Number.	Average cost.
He-buffaloes.	426	Rs. 75 per pair.
She-buffaloes.	147	Rs. 70 each.
Bulls.	20	Rs. 40 each.
Working bullocks.	790	Rs. 200 per pair. (Best animals).
		Rs. 25 per pair. (Inferior animals).
Cows.	7	Rs. 24 each (best animals).
		Rs. 15 each (Inferior animals)
Young stock.	24	
Total.	1414	

As this fair was started only recently, it has not yet attracted many cattle breeders. To attract the cattle breeders from all parts and also to induce the local people to pay better attention to the rearing of their own animals, prizes in the shape of gold and silver medals are being awarded for different items and the number of prizes awarded this year comes to 25.

During the cattle fair week, an Agricultural Exhibition was held in the cattle fair grounds when all the improved methods of agriculture were demonstrated and lectures on agricultural topics were delivered with the aid of the magic lantern. Leaflets on various subjects were distributed and samples of improved seeds of paddy, sugarcane, ragi, etc., were on show. The ryots who gathered at the fair evinced great interest in the exhibition and in the propaganda work of the Agricultural Department.

M. U. V.

Ootacamund Flower Show. Ootacamund rightly called the Queen of hill Stations has a salubrious climate resembling that of Southern Europe and all the varieties of flowers and fruit growing in that region come up well here. The persistent efforts of the early settlers and the perseverance of the Agricultural Officers have established varied crops from the largely cultivated "Great Scot'. Potato to fine types of Japanese plums and the grape-fruit. All varieties of flowers growing in temperate regions from the beautiful Asters to the fragrant verbena thrive luxuriantly in the tastefully laid out domestic or public gardens.

The annual flower show, an important event of the Ootacamund season comes off usually on the last Saturday in the bright month of May. The show is organised by the Nilgiri Agri-Horticultural Society, a body of enthusiastic residents whose prime hobby is gardening. This society, first established in 1847 as an association for growing vegetables for its subscribers, functioned for a few years only. In 1896 the Nilgiri Agri-Horticultural Society was established by the then Collector. The first Horticultural show was held in October 1869, Under the new society the first show was held in 1897 when Rs. 191 towards prizes were offered for flowers, vegetables and other garden produce. It had been a very successful exhibition. In recent years the prize money offered for the different classes of exhibits amounts to about Rs. 1200. Potted plants, cut flowers, collection of flowers in baskets and vases of cut flowers, boquets, fruits, vegetables, Dairy produce, Farm and field produce, and livestock are the different classes of exhibits at the show. The prizes offered are restricted to the produce of the Nilgiris District. Outside exhibits are also permitted for enhancing the value of the show.

Fine specimens of flowers of varied hues and selections of different kinds of fruit and vegetables at the show present the art of Nature and what the patient gardener has produced after persistent toil for the aesthetic citizen.

M. T,

Pattukottai. During the inspection of the Pattukottai sub-circle by the Dy-Director of Agriculture, III circle, lectures were delivered by him at Adirampatnam, Amarkari and Thuruvarankurichie to gatherings of ryots. An Agricultural Association was strated on 11—2—40 at Thuruvarankurichie when about 100 ryots were present. Sri. S. Rajaratnam Pillai, the president of the Annaikkadu addressed the gathering and Sri. A. Arulanandam Pillai, one of the leading Mirasdars of the place, also spoke to the ryots about the usefulness of the department. Sri G. J. Balaraj, the local Agricultural Demonstrator addressed the ryots about the usefulness of an agricultural association. The Dy. Director of Agriculture addressed the ryots about improved scientific agriculture—Demonstration plots, green manuring, use of iron ploughs etc., and stressed, that as the village contains more of small land-holders, the starting of an agricultural association would do immense good to them. An Agricultural Association was immediately started with a president, Secretary and a committee.

At *Adirampatnam, to a gathering of ryots*, the Dy. Director addressed on agricultural improvements, and advised them to pay more attention to Agriculture and its side industries.

Tiruppur Cattle Fair. Annually cattle fair and pony show are held at Tiruppur in June during the local car festival. The entire stock of cattle brought to the fair for sale being the famous Kangayam breed, it attracts a large congregation of ryots from all over the district and the neighbouring districts. The show is specially important as the best cattle in the districts are brought for exhibition and sale.

The District Agricultural Association, Coimbatore, arranges a combined agricultural and industrial exhibition during this cattle fair and pony show in alternate years. The exibitions are staged by the Departments concerned and private ryots and the district agricultural association awards prizes for the best exhibits—agricultural products, cattle, pony etc. On account of this, the shows and exhibitions during such years are very important and attractive.

Tiruppur being close to the famous Kangayam breeding tract, almost all the animals brought to the exhibition are Kangayams which are poor milkers but noted as good work animals. The Pattagar of Palayakottai is a reputed breeder of Kangayams and almost all the prize animals entered for competition are those belonging to him or his direct dependants. In almost all the years, the gold medals for the champion cow and bull are won by him. A very large transaction by way of purchase and sale takes place on this occasion.

As for the agricultural exhibition, the Department usually puts the best show with the largest collection of exhibits both Departmental and otherwise. Private ryots also take part in the exhibition and put up attractive agricultural products. The Departmental exhibits usually consist of:—

(a) Improved agricult ural implements and machinery, (b) Seeds, plants and products of different crops as paddy, cholam, ragi, cumbu, inferior millets, groundnut, castor, coconuts, cotton, sugarcane, fruits, vegetables, etc. (c) Malts and malt preparations, chemical charts, prepared cattle feeds, etc. (d) Diseased specimens of crops damaged by insects and fungii with control measures, (e) Sideline of farming-apiculture. (f) Manures and manure seeds—proper collection and preservation of cattle manure by different methods, pit and byre systems, loose box, etc., preparation of composts, green manure seeds etc. Besides, demonstrations also are conducted. M. S.

Vridhachalam. An Agricultural exhibition was held at Vridhachalam from the 18th to 25th February during the Masi Magam Festival on which occasion about 8,000 people from all parts of the district congregated. Malt making with cholam and ragi grains was demonstrated. Lantern lectures with slides were delivered on 4 nights. Specimens of fodder grasses, live specimens of green manure crops, samples of oil seeds received from Agricultural Research Stations, Palur and Tindivanam were exhibited. M. A.

Agricultural Jottings.

Grading of mangoes in Chittoor. Chittoor district is one of the biggest mango growing centres in this Presidency and has an area of 29,400 acres under mangoes. Varieties grown are Bangalora (Totapuri), Neelam, Peter, Khader and Malgoa in the order of acreage and these form the commercial varieties figuring largely in the export trade. Other varieties like Rumani, Kalapadi, Dilpasand etc. are also found here and there. The season commences in April and the early varieties like Peter, Khader and Malgoa come into the market till June. They are generally consumed in local markets like Madras. Trichinopoly and Madura

A few hundred maunds find their way to North Indian markets, but mainly due to competition much of the produce from Chittoor is unable to move to those markets in the early months. Later when this competition ceases, the Chittoor mangoes particularly the 'Bangalora' and later the 'Neelam' are exported from June to August in very large quantities. The total annual production of mangoes in the district is estimated at about two million railway maunds and the export trade to other provinces amounts to 114 000 Railway maunds per year. The chief exporting centres are Chittoor, Damalcheruvu, Kalahasti, Chandragiri and Puttur.

Daily one to three wagon loads are booked from these stations and during heavy seasons train loads move from some of these places. The average exports of mangoes from this district by rail for the past three years were as follows:—

Bombay 69,000 railway maunds, Central Provinces 29,500 railway maunds, Nizam's State 11.000 maunds and other provinces 5,000 maunds, besides about 50,000 railway maunds within the province.

Mangoes for export to Bombay and North India are packed in baskets. But to nearer markets like Madras, Trichinopoly, Madura, Salem and Hyderabad, no packing is done but they are despatched loose in wagons especially the variety Bangalora. This leads to a lot of damage in transit.

There is no regular system of grading the fruits. Big, medium and small are mixed generally. This leads to poorer prices being obtained. In order to demonstrate to the producers and merchants the benefit of selling the produce after proper grading an experimental grading station was opened during the last season at Chittoor. Preliminary work commenced in May, and exports commenced from the second fortnight of June.

Mangoes for export should first satisfy certain general conditions. The fruits must be firm; reasonably uniform in colour, and must have reached a certain stage of maturity. No mango should be entirely green and each should have the shape normal to the variety and should be free from malformation and defects due to disease or insects or mechanical injury.

The mangoes are then sorted according to their weight into three classes, Special, First Grade and Second Grade. Bigger fruits like 'Bangalora' and 'Malgoa' should have minimum weights of 40, 30 and 20 tolas per fruit for the above grades respectively; smaller fruits like 'Peter' and 'Neelam' should have 20, 12 and 8 tolas as minimum weights per fruit.

Each fruit of special grade is carefully wrapped in tissue paper, and then packed in baskets with straw layers. For other grades, individual fruits are not wrapped in tissue paper. Each grade is packed separately. The baskets are labelled with the special labels bearing the "AGMARK" design and are sealed. Each grade has a distinctive coloured AGMARK label. The label for Special is white, for first grade red, and for second grade blue.

Over 3500 baskets weighing about 1500 Railway maunds were despatched to Bombay and sales effected with the assistance of the Provincial Marketing Officer of that Province. Grading of fruits is appreciated by the Bombay merchants and a premium of four to eight annas per Railway maund was obtained for the special quality. The garden owners of Chittoor will therefore be well advised to take up grading of mangoes on a larger scale in the ensuing season. Those desirous of doing so can address the Provincial Marketing Officer, Post Box No. 414, Chepauk, Madras for further particulars and the necessary assistance.

Weather Review—FEBRUARY 1940.

RAINFALL DATA

Division	Station	Actual for month	Departure from normal @	Total since January 1st	Division	Station	Actual for month	Departure from normal @	Total since January 1st
Circars	Gopalpore	0·1	−0·6	0·1	South	Negapatam	0·1	−0·5	0·1
	Calingapatam	0·3	−0·2	0·3		Aduthurai *	0·0	−0·4	0·2
	Vizagapatam	0·4	−0·5	0·4		Madura	0·0	−0·4	0·0
	Anakapalli *	0·1	−1·2	0·1		Pamban	0·0	−0·7	2·2
	Samalkota*					Koilpatti*			
	Maruteru *	0·0	−1·0	0·0		Palamkottah	0·0	−0·7	0·1
	Cocanada	0·0	−0·3	0·0					
	Masulipatam	0·0	−0·4	0·0					
	Guntur*	0·0	−1·1	0·0	West Coast	Trivandrum	0·0		0·0
						Cochin	0·0	−0·8	0·1
Ceded Dists.	Kurnool	0·1	−0·1	0·1		Calicut	0·0	−0·2	0·1
	Nandyal*	0·0	−0·3	0·0		Pattambi *	0·0		0·0
	Hagari *	0·0	−0·3	0·0		Taliparamba *			
	Siruguppa*	0·0	−0·3	0·0		Kasargode *	0·0	−0·2	0·0
	Bellary	0·0	−0·2	0·0		Nileshwar*	0·0	−0·2	0·0
	Anantapur	0·0	−0·3	0·0		Mangalore	0·0	−0·1	0·0
	Rentachintala	0·0		0·0					
	Cuddapah	0·0	−0·1	0·0					
	Anantharaju-pet *	0·0		0·0	Mysore and Coorg	Chitaldrug	0·0	−0·1	0·0
						Bangalore	0·0	−0·2	0·0
Carnatic	Nellore	0·1		0·2		Mysore	0·0	−0·2	0·0
	Madras	0·0	−0·3	0·1		Mercara	0·0	−0·2	0·0
	Palur *	0·0	−0·7	0·0					
	Tindivanam *	0·0	−0·9	0·6					
	Cuddalore	0·0	−0·9	0·3	Hills	Kodaikanal	0·0	−1·4	0·0
						Coonoor			
Central	Vellore	0·0	−0·3	0·0		Ootacamund *	0·0	−0·2	0·0
	Salem	0·0	−0·3	0·0		Nanjanad *	0·0	−0·6	0·0
	Coimbatore	0·0	−0·3	0·0					
	Coimbatore A. C. & R. I.*	0·0	−0·5	0·0					
	Trichinopoly	0·0	−0·6	0·0					

*Meteorological Stations of the Madras Agricultural Department.

@ From average rainfall for the month calculated upto 1937 published in the Fort St. George Gazette.

The weather has been dry over the country but for the isolated light showers in the Konkan, North Madras Coast, South East Madras and the Madras Deccan. Skies were lightly to moderately clouded in South East Madras, North Madras Coast, Mysore and South Hyderabad, and clear or lightly clouded in the Konkan, and South Bombay Deccan. Humidity was in excess in the Konkan, Bombay Deccan and North Madras Deccan and in defect in South East Madras, Malabar and Mysore. Both maximum and minimum temperatures were above normal in the Konkan and below normal in the Madras Deccan, Mysore and North Madras coast.

Rainfall was practically nil and below normal throughout the presidency.

Weather Report for Agricultural College and Research Institute, Observatory, Report No. 2/40.

Absolute Maximum in shade	...	92·8°F.
Absolute Minimum in shade	...	58·0°F.
Mean maximum in shade	...	89·9°F.
Departure from normal	...	-0·6°F.
Mean Minimum in shade	...	63·8°F.
Departure from normal	...	-2·0°F.
Total rainfall for the month	...	Nil.
Departure from normal	...	-0·50"
Heaviest fall in 24 hours	...	Nil.
Number of rainy days	...	Nil.
Mean daily wind velocity	...	1·86 miles per hour.
Departure from normal	...	-088 miles per hour.
Mean Humidity at 8 hours	...	73·1%
Departure from normal	...	+1·2%

Summary. Weather was dry throughout the month. Skies were lightly to moderately clouded and the humidity was in slight excess. Rainfall was nil being 0·5" below normal. Both the mean maximum and mean minimum temperatures were slightly below normal. P. V. R. & F. L. D.

Departmental Notifications.

Gazette Notifications.

Appointments.

Sri. V. T. Subbayya Mudaliar, Upper Subordinate, Agricultural Section is appointed as officiating Assistant Director of Agriculture. Pattukottai in Category 6, Class I, Madras Agricultural service without prejudice to his leave.

Sri. A. Gopalan Nair, Farm Manager, Central Farm, Coimbatore is appointed to officiate as Assistant Director of Agriculture, Pattukottai during the absence of Sri. V. T. Subbayya Mudaliar on leave or until further orders.

Sri. D. Marudaraja Pillai, Assistant in Mycology, in Category I, Class I, Madras Agricultural Subordinate service is appointed to a post in category 5, Class I, Madras Agricultural service and to act as Government Mycologist. Coimbatore, Vice Sri. K. M. Thomas, granted leave.

Name of officers	From	To
Sri. V. T. Subbayya Mudaliar	Asst., D. A. Pattukottai.	Asst. D. A. Tinnevelly.

Leave

Name of officers.	Period of leave
Sri. K. M. Thomas, Govt. Mycologist, Coimbatore.	L. A. P. For 3 months from date of relief.
Sri. R. Chockalingam Pillai, Asst. D. A., Tinnevelly.	Leave on half average pay for 6 months from 27-3-40.

Subordinate Services.

Appointments.

The services of Dr. R. Sankaran, Assistant in Cotton, are placed at the disposal of the Government of India for appointment as Cotton Botanist in Sind under the Indian Central Cotton Committee for a period of five years from 1st March 1940.

The following substantive appointments of Upper Subordinates in the Agricultural section are ordered with effect from 15th August 1939.

1. V. Chidambaram Pillai, Upper subordinate, Agricultural section provisionally substantive IV Grade to be substantive in the same grade.
2. P. P. Syed Muhammad Sahib, Upper subordinate, Agricultural section, provisionally substantive in new III grade to be substantive in the same grade.

Promotions.

The following provisionally substantive promotions are ordered with effect from 1st March 1940.

(1) Sri. S. Dharmalingam Mudaliar, Assistant in Paddy section, Pattambi in II grade old to I Grade (Old).

(2) Sri. T. S. Ramakrishna Ayyar, Assistant in Mycology section in III Grade (old) to II Grade (old).

Sri. M. Subrahmanyam Pillai, Upper subordinate Agricultural section, IV grade (Old) on Rs. 120-10-170 is promoted to III grade (old) on Rs. 200/- provisionally substantive-with effect from 15th August 1939.

Confirmations.

(1) Sri. K. Kuppamuthu to be permanent in the Agricultural section from 15—8—39.

(2) Sri. E. J. Verghese to be permanent Asssistant in the Mycology section from 15—8—39.

(3) Sri. N. G. Narayana to be Assistant in cotton from 15—8—39.

(4) Sri. C. K. Ramachandran to be permanent in the Agricultural section from 15—8—39.

(5) Sri, M. L. Balasundaram to be permanent in Agricultural section from 15—8—39.

(6) Janab P. Abdul Samad Sahib to be permanent in the Agricultural section from 23—12—39.

(7) Mr. K. C. Thomas to continue to be provisionally substantive in the Agricultural section.

(8) Sri. B. S. Narasimhamurthi to be Assistant in Cotton provisionally substantive from 15—8—39.

(9) Sri. K. Saptharishi to be Assistant in Chemistry provisionally substantive from 15—8—39.

(10) Sri. P. Somayajulu to be provisionally substantive in the Agricultural section from 15—8—39.

(11) Sri. V. Venkatadri Reddi to be provisionally substantive in the Agricultural section from 23—12—39.

Transfers.

Name of officers	From	To
Sri. D. Visvanatha Reddi,	F. M.. Central Farm Coimbatore.	F. M., A. R. S., Anakapalli.
,, N. V. Narasinga Sastry,	F. M., A. R. S., Anakapalli	A. D. Kothepeta.
,, R. Ananthapadmanabha Pillai,	A. D., Mudukulathur	F. M., L. R. S., Hosur.
,, R. Subbiah Pillai	A. D., Satur	A. D.. Mudukulathur.

Leave.

Name of officers.	Period of leave.
Sri M. Satyanarayanamurthy, A. D., Yellamenchilli,	L. a. p. for 2½ months from the date of relief
„ P. Bhagirathi Padhi, A. D., Narasannapeta,	L. a. p. for 2 months from 1—3—40.
„ V. N. Subbanna Acharya, A. D., (on leave),	Extension of l. a. p. for 30 days from 27—2—40.
„ D. Panakala Rao, A. D., Ramachandrapuram,	L. a. p. for 2 months from 4—3—40.
„ K. Soopi Hajee Sahib, Lower Subordinate,	Extension of l. a. p. for 28 days from 4—3—40.
„ P. Seetharamaiah, Botany Asst., A. R. S., Anakapalli,	Extension of l. a. p. for 30 days from 14—3—40.
„ N. Ranganatha Chari, A. D., Dhone,	L. a. p. for 30 days from 27—3—40.
„ B. Shiva Rao, A. D., Tuni,	Extension of l. a. p. for 2 months from 1—4—40.
„ P. Krishnaswami, Asst. Millets, D. F. S., Hagari,	L. a. p. for 1½ months from 27—3—40.