

The Madras Agricultural
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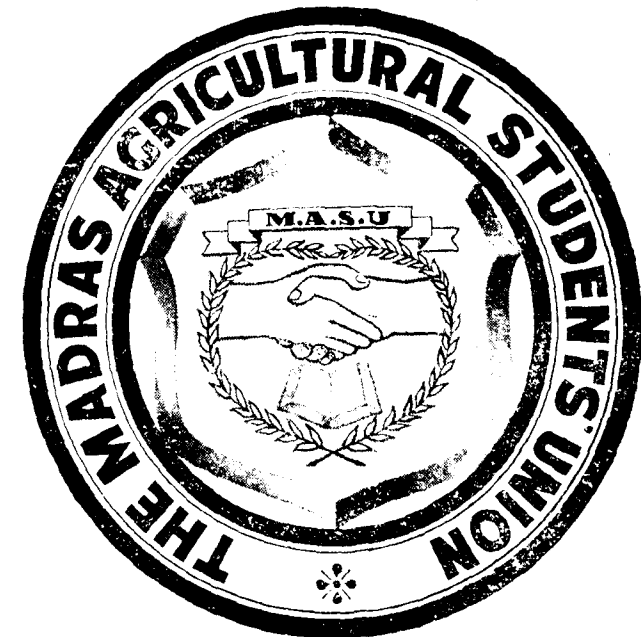
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Vol. XLVI

May 1959

No. 5



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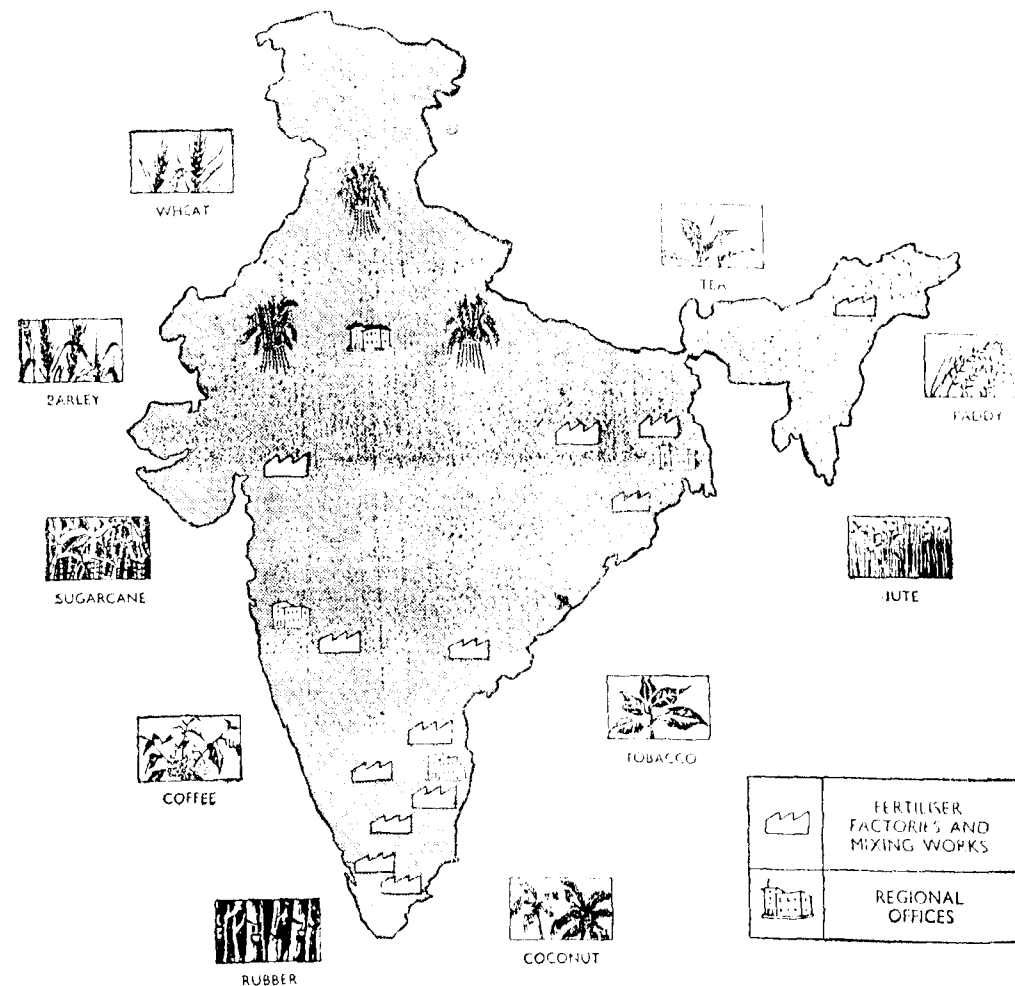
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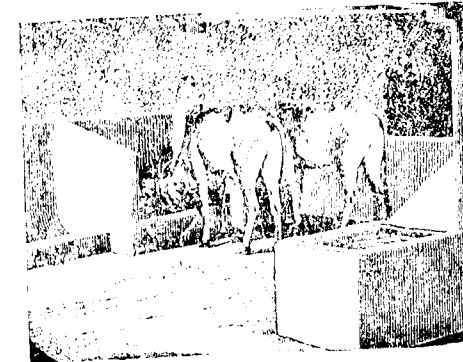
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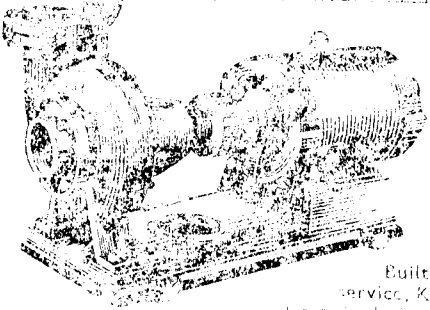
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The Madras Agricultural Journal

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Editorial

Fertilisers: One of the important methods for higher crop production in any country is the judicious use of fertilisers. Compared with the position three decades back, cultivators are now using large quantities of fertilisers, thanks to the propaganda and facilities provided by the Central and State Governments. Manure Firms, have also played a great part. Nitrogenous fertilisers, especially Sulphate of Ammonia, finds the greatest use with most crops and annually about 2 lakh tons of this fertiliser or its equivalent is applied to crops in this State. Taking the irrigated area alone this works out to about 90 lbs. of sulphate of ammonia per acre containing about 18 lbs. of nitrogen, while the requirements are estimated at about 30 to 40 lbs. So the fertiliser consumption can easily be doubled and even trebled and crop production increased in similar fold. Out of his total expenditure on Agriculture, the Japanese farmer is reported to spend one third on fertilisers alone. Anticipating greater need for fertilisers, there is increased provision for production of fertilisers in the second and third Five Year plans. With increased production, there is equal need to see that the fertilisers produced are fully and properly utilised.

To focus attention on the use of fertilisers, a Fertiliser Workshop and Seminar was held at the Agricultural College and Research Institute, Coimbatore from 19th to 22nd April 1959. It took stock of the available information on crop requirements, best methods of application, distribution channels and publicity aspects. There was free exchange of views among those assembled — Research Officers, Extension personnel, administrators, farmers and fertiliser firms. The conclusions arrived at, will no doubt be valuable and will indicate the line of action both in the immediate and distant future.

Valuable information on the fertiliser requirements of the major crops is already available but a good deal is yet to be acquired through research. In view of the great strides in fertiliser production expected under the National plans, elaborate experiments into the

requirements of all important crops both under Farm (Government) and cultivator's conditions, are necessary. Besides assessing requirements, methods of application, effect on soil of the different fertilisers, and interaction with the different agronomic practices have to be determined. On the extension side, the best methods of dissemination of results of research have to be investigated. On the administrative side the methods, places and seasons of storage of fertiliser, prices and channels of distribution, have all to be worked out so that efficient and full use of fertilisers can be made when they are produced in large quantities.

One aspect that should not be forgotten in India, is that the fertilisers are likely to exhaust the soil organic matter and calcium as well. So all possible resources to augment the organic manures for use in crop production, have to be tapped. The green manures, the composts, the bones and oil cakes, have a great part to play in increasing production, along with the fertilisers. This aspect is important in a tropical country like India where the soils are low in humus and it is difficult to build up any reserves of soil organic matter.

The economic aspects of fertilisers cannot be ignored. Paying cash crops usually have a lion's share of the fertilisers consumed. Big farmers similarly consume more fertilisers than small farmers; the literate more than the illiterate. The price factor and the credit needs of the farmers have also to be kept in view in the context of fertiliser use in the future.

A Glimpse Into World Sugar Industry

by

S. V. PARTHASARATHY, M. Sc.,
Chief Sugarcane Officer, Thiru Arooran Sugars Ltd.,
Vadapathimangalam.

Introduction : India is planning to expand its sugar industry. The ninth session of International Society of Sugarcane Technologists was therefore appropriately held at Delhi in January this year. This gave opportunity for many scientists and farmers of this country to come into contact with the International authorities visiting this country on this occasion. A review of the salient features of the industry of different countries as could be gathered from this conference may therefore be of interest to the farmers at large.

Sugarcane cultivation in India is ancient in origin while the introduction of Sugarcane in many countries like Australia or Cuba is comparatively recent. But these have advanced considerably in the modern white sugar industry. Some important dates on the global spread of cane are mentioned below :

- 766 B. C. Probable date of introduction of cane into China from India by Buddhist monks.
- 327 B. C. Alexander, the Great took cane to Europe from India.
- 600 A. D. Chinese Mission sent to Bihar to study gur making.
- 641 A. D. Arabs introduced cane into Egypt.
- 1420 A. D. Dan Henry the navigator introduced cane into Madeira from where subsequently it reached West Africa.
- 1493 A. D. Columbus in his second voyage took canes to Hispaniola.
- 1520 A. D. Cane reached Mexico.
- 1532 A. D. „ „ Brazil.
- 1535 A. D. „ „ Peru.
- 1547 A. D. „ „ Cuba.
- 1548 A. D. „ „ Puerto Rico.
- 1615 A. D. Sugars first made in Japan.
- 1637 A. D. Sugars first exported from Java.
- 1660 A. D. Sugarcane first planted in Jamaica
- 1670 A. D. Cane introduced in Argentina.
- 1751 A. D. Cane introduced in Louisiana.
- 1817 A. D. Thomas Scott carried cane to Australia.
- 1835 A. D. Sugar first manufactured in Hawaii.

Harvesting is from December to May. In Louisiana, planting is done before winter and the sprouts are killed by the low winter temperature. In spring the field is off barred to expose the stubble to warm air and sun to stimulate sprouting. In Hawaii planting is done almost round the year but is mainly done from March to August. The crop is generally 22-24 months age at harvest. The first plant crop in some cases, may be harvested at 14 months age on account of tasseling and in high elevation it may be of even three year duration. Spraying the crop with chemical like Maleic hydrazide or applying heavy nitrogenous fertiliser prior to flowering are practised to suppress flowering. In some cases planting time is altered for the same purpose. The planting season in Java is from April to July and harvesting from May to September. In the tropical belt of Australia cane is planted from April to June and in sub-tropical belt from January-March and August-September. All harvest are from June to December. In the Phillipines planting generally synchronises with harvest and top portion of canes are utilised for seed. Planting is done before the cessation of rains in January and the young crops suffer in the dry months January-May when many plants die down. The farmers adopt a very high seed rate to compensate for this. The harvesting period is from November to June. In Barbadas planting is in November and the crop is harvested after 16-18 months.

In Jamaica the spring planting (March to May) or Autumn planting (August to October) are practised depending upon rainfall distribution and irrigation. The harvest is from January to June. The harvest period and approximate age of the crop at harvest are summarised below :—

Country	Harvest Season	Approximate age of crop at Harvest.
Argentina	June—October	12 months
Cuba	December—June	18 months
Hawaii	January—December	22-24 months
Indonesia	May—November	12 months
India	December—May	12-14 months
		18 " (Adsali crop)
Lousiana	October—January	12 months
Mauritius	August—January	18-24 months
Mexico	December—May	16-18 months

Country	Harvest Season	Approximate age of crop at Harvest
Natal	May—April	14 months
Phillipines	Novembr—June	11-14 months
Peru	January—December	20-24 months
Puertorico	January—June	14-18 months
Java	November—June	12 months
West Indies	December—June	12-14 months

Irrigation & Manuring : In Cuba, 73% of the cane area is without irrigation and manuring. Only 5% of the area irrigated and manured. New plantings are not generally fertilised. The average rainfall is 50-60" and 85% of the precipitation is from April—October. The ratoon crops that are manured receive about 350 lbs of Chilean nitrate per acre. The average yield is 14 tons per acre. In Hawaii the cane crop is raised both under rainfed and irrigated conditions. The average yield of the crop is 62 tons cane per acre. In Lousiana the crop is fertilised with anhydrous ammonia and irrigation is not common. Rainfall is normally sufficient for the requirement of the crop.

In Mexico nearly half the area is rainfed and the crop suffers in the dry season. The mean yield is about 20 tons cane per acre. In Barbados the plant crop is fertilised with 4 cwts of ammonium Sulphate (90 lb. Nitrogen) and 1½ cwt of muriate of potash per acre while the ratoons receive a little larger dose. In low rainfall areas the dose of nitrogen is reduced to 3 cwts of ammonium sulphate per acre. The cane crop does not appear to be irrigated particularly in the long spell of dry season from December to May and the soil moisture is conserved by heavy organic mulch of trash, grass and bagasse. The cane is harvested at the age of 16-18 months and the average yield is 33 tons of cane per acre. In Jamaica, sugarcane is raised both under irrigation and under natural rainfall conditions. The average yield is 33 tons of cane per acre. In Australia, 2 cwts of ammonium sulphate for plant cane and 4-6 cwts to ratoon cane applied. The duration of the crop is 22-24 months and the crop is raised both under irrigation and under rainfed conditions. The average yield under irrigation is 46 tons of cane per acre and under rainfed conditions it is 18 tons of cane per acre. In Java cane is cultivated under irrigation. The crop is normally fertilised with about 4 cwts of ammonium sulphate per acre and about 1 cwt of

double super phosphate. The crop is harvested at the age of 12-14 months with an average yield of about 45 tons cane per acre. In Phillipines too the crop suffers from drought in the dry season when many plants die down. Ammonium Sulphate is the commonest fertiliser though in recent years complete fertiliser mixtures are coming into popular use. Average yield is 20 tons cane per acre.

In harvesting the crop, in a few countries like Australia and Louisiana the cane crop is burnt to facilitate cutting.

Pest and Disease: In Cuba, there are no serious diseases. Mosaic is under effective control. Of the insect pests, the borer is important, and is controlled by the natural parasite the Cuban fly. In Louisiana, mosaic is important and immune varieties are developed. At present ratoon stunting is of considerable importance. Of the pests, borer is the principal one and because of severe winter no parasite could be established. It is mainly controlled by dusting cryolite or ryania by tractor units or air plane. Trichogramma parasites are commercially sold to the cultivators.

In Mexico mosaic is the important disease. Of the pests the five strains of diatroea and the spittle bug are of importance. Rats are also important here. In Barbodas, ratoon stunting disease is the only disease of importance. The stalk borer, the root borer and root infesting mealy bugs are the important pests. For the stalk borer the department of Agriculture rears and distributes at timed intervals, masses of Trichogramma parasite.

In Jamaica, mosaic is wide spread. The resistant varieties of Barbados sometimes prove susceptible here. Hence, Jamaica, imports fluff from Barbados for complete local selection. Chlorotic streak is next in importance as also ratoon stunting disease. These are controlled by heat treatment of planted setts. Leaf spot disease attains importance in potash deficient soils. The pests are of occasional importance and of these white grub, brown weevil borer and moth borer are important. The moth borer is checked by natural parasite and the other pests are warded off by increased standard of cultivation.

In Australia the major diseases have been eradicated and the Fiji disease exists only in small areas. Ratoon stunting is wide spread and this is effectively controlled by hot water treatment. Of the pests the grey back beetle and wire worm are now under complete control by extensive use of B. H. C.

In Java, mosaic, leaf scald and Fusarium pokka bong are common. The top borer and the stem borer are the pests.

Cane Payment: In most countries the cane supply to the sugar factory is by farmers whose holdings vary in size. In Cuba the farmer is paid on "Sugar percent cane basis". He is given 5.5. or 6.0 or 6.5 tons of sugar per 100 tons of cane delivered to the factory. He is also given 49% to 50% of the value of molasses. In Louisiana the individual shipment of cane is sampled, the juice analysed in small mill and the value reduced to commercial units by appropriate formula. For normal cane yielding 160 lb. of 96% sugar the farmer is paid the value of 106 lb. of sugar i. e., he gets 66.25% of the value of sugar. In addition he is paid bonus for molasses. The transport of cane from loading centre to the factory is at the cost of the factory. In Mexico the cane is supplied by farmers whose average holding is about 7 acres. The farmer is paid on the basis of quality of cane.

Less than 9% recovery	50% of the price of sugar
8—10%	Additional 48% for surplus over 8%
10—11%	45% for surplus over 10% recovery
11—12%	40% for surplus over 11% recovery
More than 12%	35% for surplus over 12% recovery.

Besides the farmer shares 50% of the value of molasses.

In Jamaica the industry produces nearly two third the cane required in its own estate. The cane that yields 1 ton of sugar for 9 tons of cane is taken as of basic quality and it is paid 66% of the value of sugar. This percentage share may vary with the different factories. For increase or decrease in quality the percentage share is varied. In addition to this the farmers receive 50% of the value of by-product of the factory. The approximate price of cane in 1952 was equivalent of Rs. 37/- per ton of cane. The farmer is paid a basic price, a second bonus and the third final price at the close of the season.

In Australia, cane growing is by farmers whose average holding is 60 acres. The farmer is paid on the basis of analysis of his cane. The award is made by the Central Prices Board which is a statutory judicial body.

In Java, the cane is drawn from factory's own estates as well as from farmers. The latter is paid on the basis of Kasimo formula.

$$a = \frac{R \times H}{1000} \times 5.50 \text{ where}$$

a = Price per 100 kg. of cane

R = Rendement (kilos of crystal per quintal - 100 kg. of cane)

H = Sugar price fixed by Government

Research : In Cuba the mill research is by the university and the field experiment by the Ministry of Agriculture. The levy on sugar at half a cent per bag though intended by law for sugar experiment station, is not spent for the purpose. In Louisiana the agricultural experiment station is run by the state university.

The department of Agriculture runs an experiment station at Houma and at Cannal point, Florida. The American sugarcane League of New Orleans publishes sugar bulletin and acts as a liason agency between the industry and research institutions.

In Mexico there are two organisations engaged in research - the National Union of sugar producers and the Bureau of Agriculture. The bank of Mexico and the National union of sugar producers grant scholarships to young scientists for study in foreign institutions. In Jamaica the sugar manufacturers association maintains a research department controlled by a committee appointed by the association, the department of agriculture, the farmers and sugar estates. The work of the department is mostly decentralised over the entire industry and over 200 field experiments are laid every year and this is augmented by field sample survey method.

In Australia, the research is by the Bureau of sugar experiment station created by an act in 1900. It conducts experiments on all aspects of the industry. In 1949 Sugar Research Limited was formed by the factories and it conducts research on Mill Technology and Engineering. The colonial sugar refining company has its own breeding nursery and field chemists for investigation work.

In Phillipines the 'Phillipine Sugar Association' created in the early twenties conducted research upto early thirties. When sugar production was limited the research activities were suspended.

After the war research was revived and the Phillipine sugar institute was created by law in 1951 to serve the needs of research. This institute is financed exclusively by planters and millers.

Government Control : In most of the countries the Government have enacted laws which regulate the production prices and wages of labourers. In Cuba the sugar coordination law of 1937 is the most important single law which deals with protection for small cane growers, payment for cane, rent for cane farm, wages for cutting and hauling cane and minimum wage for agricultural and industrial labourers. In this country, the raw sugar, the mill owned sugarcane, the farmers cane, the domestic consumption sugar, molasses and syrup are taxed under law. In addition there are municipal and provincial taxes on lands and properties devoted to cane cultivation, tax on operating capital, income tax, profit tax etc., The commission for sugar arbitration (1937) is meant for solving the differences between the mills and the farmers. Since 1946 under the law the farmers can appoint chemist to inspect the factories, the scales, the laboratories, warehouses and molasses tanks. There are two prominent companies which do the inspection on behalf of farmers.

In Louisiana, since 1934, the industry is under close control by Government through the sugar act. This act limits production of sugar, fixes price and bonus for the cane. The sampling and analysis of cane is by factory staff but subject to inspection by the department of agriculture. The minimum wages for factories and labourers are fixed by the Government. There is a great dearth for labourers and effort is made both in the factory and field to reduce the labour requirements. In Mexico the industry is controlled by the Bureau of National Economy. Sugar is taxed in Mexico and part of it is reverted to the producer for developing the industry.

The minimum wage for the labourers is fixed under the law. In Jamaica, the delivery of cane, its price, price of sugar and fixing of local export quotas are fixed under statute. Excise duty on sugar and cess on cane are levied. The latter is intended for the maintenance of all island Jamaical Cane Farmers Association.

In Australia, the Government assign quotas for production, fix cane price, acquire and market sugar. Each cane grower is assigned an area on which he is to raise cane and supply to the specified factory. Under sugar acquisition Act, the State Government enters into agreement with Federal Government for production and

marketing of sugar. The Government purchases all the raw sugar and accept the responsibility for losses arising from export of surplus sugar. The Sugar Experiment Station Act; empowers the Bureau of Sugar Experiment Station to levy cess on cane and finance research in field and mill. This station controls cane varieties, diseases and pests by legislation. There are no direct levies by Government and the levies are by the Board. The Queensland cane grower's association levies the cane growers for organisational work. There is no excise duty on sugar. In Java, the land rent decree (1918) assigned area for each factory from which it can rent land for sugarcane. The levels of land rent are also fixed by Government. During the war the sugar industry, was almost non-existent and now the industry is fast reviving. In Phillipines the Government determine the local consumption and export quota and also assign production for each factory through quota administration. The sugar industry decided not to depend too much on Government technical help and levied upon itself certain contributions and constituted sugar Research and stabilisation fund. This is mainly utilised for research. The sugar quota administration is Government bureau for allocation of production and marketing quotas among the mills and marketers. For the benefit of the labour the Government instituted various laws.

OBITUARY

We regret to announce the sudden demise of Sri G. K. Chidambaram, Assistant Agricultural Chemist, Coimbatore on 22-5-1959. An Honours Graduate in Chemistry of the Presidency College, he joined the Department of Agriculture as Assistant in Chemistry in 1927. He was gazetted as Assistant Agricultural Chemist in 1946. Unostentatious, handworking and conscientious, he won the hearts of many who came in contact with him. He was closely associated with the Tungabhadra and Fruit soil surveys in Ceded Districts. He was a member of the teaching staff for some time of the Agricultural Colleges at Coimbatore and Bapatla. He was a noted bridge player and member of the Agricultural Officers' club for a long time.

We offer our heart felt condolences to the members of the bereaved family.

Stigma Receptivity in Cytoplasmic Male-Sterile Sorghum Type Under Indian Conditions.

by

K. MAHUESWARAN,
Millet Assistant Agricultural College and Research
Institute, Coimbatore.

Introduction: In a programme of breeding hybrid sorghums, utilisation of cytoplasmic-induced male-sterile lines has great advantages. In this, however, it became necessary to study how far the stigmas are similar to the normal fertile ones in their behaviour under different environmental conditions.

Floral biology has been studied in this crop by Ball (1910), Graham (1916), Ramanathan (1924), Vinall (1926), Patels (1929), Rangaswami Ayyangar and V. Panduranga Rao (1931) etc. In general, it is given that the stigmas come out first sometimes as early as 15 to 36 hours before the appearance of the stamens. Ball and Vinall record that the flowers open in the early morning hours. According to Patels it is in the forenoon from 4 A. M. Graham says it is from 11 P. M. to 4 P. M. the next afternoon. Ramanathan's findings show that the flowering period is between 1 A. M. to 4 P. M. According to observations made at Coimbatore, it varies from variety to variety. *S. durra*, *S. roxburghii*, *S. nervosum* commence opening their flowers at midnight and the opening continues till 8 A. M. and may get prolonged to 10 A. M. at the most. *S. margaretiferrum*, a sorghum from Sierra Leone Flowers from 8. A. M. to 4 P. M. and it is recorded that a panicle takes 9 days to complete the anthesis.

Cytoplasmic male-sterile one was first isolated in America from a cross between Day Milo and Kafir. Ross (1957) studied in detail the receptivity of the stigma in two lines of cytoplasmic male-sterile ones in the year 1957. He used panicles which were bagged at the time of the exertion of the head and about 2 to 3 days before flower opens. Such heads were left for seven days and then pollinated at 2 day intervals till the 29th day after bagging. To facilitate observations, heads were bagged on different days and for each set of pollinations, five panicles were taken at a time. He concluded that stigmas in some flowers at the base of the panicle may remain receptive 15 to 17 days after bagging. The majority were non-receptive.

Several male-sterile lines were added to the collections of sorghums at the Millet Breeding Station, Coimbatore with a view to utilise for hybridisation. Studies were conducted to examine the stigma receptivity under the local conditions.

Materials and Methods : The material consisted of a single male-sterile line obtained from Dr. Parker, Chandigarh, Punjab. The observations on the stigma receptivity were conducted during the summer seasons 1957 and 1958. The plants were grown under irrigation. The plot size was 25 links long and 2 links broad with 4 links wide between plot to plot. A set of five plants in each plot was selected for observations, constituting ten groups each year.

In the sorghum panicle the anthesis generally, proceeds from the apex of the panicle towards the base. Each day a set of flowers matures and blooms. This blooming period extends to 9 days from the opening of the first flower to that of the last flower. In a study on the longevity of the stigma-receptivity the number of flowers opening on a different day contributes to vitiate observations. To overcome this difficulty, each panicle from all the selected plants were treated in such a manner that about 100—200 florets all opening on the same day were left untouched and the others were clipped off. The prepared panicles were bagged on the same day and an interval of one day was given to confirm the emergence of the stigmas of all the flowers. Each set of five such prepared plants was pollinated each day with pollen collected from several varieties. The last dusting was on the 11th day after bagging. The bags were removed after 20 days from the date of last pollinations. The seed set in each panicle was counted and the average for each set of five panicles was worked out. The summarised data is given below :

Particulars	American Condition		Indian Condition	
	Estimated seedset %	Actual seedset %	Summer 1957	Summer 1958
Days after bagging				
1st day				
2nd day			41	44
3rd day			30	47.6
4th day			66	53.4

Particulars	Estimated seedset %	Actual seedset %	
		Summer 1957	Summer 1958
Days after bagging			
5th day		73	34.5
6th day		38	39.8
7th day	81	11	34.5
8th day		Missing	29.7
9th day	86	6.2	8.5
10th day			3.8
11th day	83		2.5
13th day	72		
15th day	29		
17th day	13		
19th day	⊙		
21st day	⊙		
23-29th day	⊙		
Latitude	38° 52' N.	11° N.	
Longitude	99° 19' W.	77° E.	
Maximum mean temperature	88-98° F.	83-96° F.	
Minimum mean temperature	45-59.3° F.	64.2-74.2° F.	
Altitude	2000 a. s. l.	1414 a. s. l.	
Soil	Silt loam	Red loam	
Rainfall (annual)	21.10"	23.23"	

⊙—A few seeds.

Discussion : The data shows that the sorghum stigmas can remain receptive for a period of 11 days after exertion. However the receptivity is highest till the 5th day. Thereafter it becomes markedly low till the eighth day. Ross tested the panicles for receptivity till 29 days after bagging. Though a few seeds were set they were rather poor. In his observations the maximum seedset is within 5 days. He seems to have assured that in a given period of 7 days after bagging all the flowers would have completed blooming. In sorghum the observations of previous workers showed that under

bagged conditions blooming can take place for 9 days. This probably explains the occurrence of seedsetting beyond the 17th day upto 29th day. The observation made in their stations show that stigmas can remain receptive for 10 days.

It is concluded that under Indian conditions also the stigmatic receptivity is similar to the American conditions.

Summary : A cytoplasmic male-sterile line A. 385 was received and longevity of stigma receptivity studies were conducted under Indian conditions similar to American conditions. The maximum seedset was on the fifth day and there was seedsetting even on the eleventh day. Thus it has been concluded that the stigmas are receptive for a period of 10 days both under Indian and American conditions.

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A Note on the Effect of Placement of Phosphate on the Yield of Paddy

by

T. KALYANIKUTTY, A. ABDUL SAMAD, K. RAJAGOPALAN
A. SHANMUGASUNDARAM

Introduction : Application of phosphatic manures as superphosphate in combination with nitrogen in the form of ammonium sulphate over a basal dressing of green leaf has been found to be essential to obtain high return in rice cultivation. Though most of the soils in Madras State are deficient in available P_2O_5 , it has been found that the response to application of phosphates has been limited and is often erratic. This is mainly due to fixation of phosphates by the soil thereby making it unavailable to crops. With the usual method of surface application, about two thirds of the phosphates is locked up within an inch or two of the place of application depending upon the calcium content of the alkaline soils or iron or aluminium in the soils. Experiments on the placement of phosphates in the vicinity of roots have yielded useful results in certain crops. Apart from this, application of phosphates through green manure crops or through composts is also reported to make the phosphate readily available to the plant.

Superphosphate mixed with turnip seed and sown in drill was found more efficient than when the fertilizer was applied direct on the surface soil as early as in 1847 by Lawes (Cooke, 1949). Experiments on cereals showed that combined drilled dressing of superphosphate gave higher yields than broadcast dressings of the fertilizer (Crowther, 1945 and Frank, 1948, quoted by Cooke and Widdowson, 1955). Stewart (1952) concluded that the benefits from placement of the fertilizer were greatest on poor soils deficient in phosphates. Moreover when the fertilizer is placed in the vicinity of root zone of crop plants it is more efficiently utilized than when broadcast and losses of nutrients due to leaching, gas formation etc., are minimised. Further the immobility of phosphates when applied to the soil necessitates placing of such fertilizers as near the roots of the plants as possible. Cooke and Widdowson (1955), while reviewing the experiments on placement of the fertilizer in many countries have rightly pointed out that on soils which have been adequately manured for many years placement is not likely to provide marked benefits. However, gains in yields are obtained by using some method of localising the fertilizer to the seed or roots of crops especially in soils

which are deficient in available nutrients. Patel (1955) found in sugarcane that by mixing superphosphate with sieved compost or dung in 1:3 or 1:5 proportion for a week or two and applying this by the row or band method gave promising results. In rice, work done at Central Rice Research Institute, Cuttack during 1949-'50, 1950-'51 and 1951-'52 has shown that no yield response due to phosphate fertilization was obtained even when higher doses of superphosphate upto 120 lb. P_2O_5 per acre were applied either broadcast on the surface or as pellets placed deep in the soil.

Field trials to test the efficacy of placement of superphosphate on the yield of rice were conducted at Agricultural Research Station, Pattambi during 1948 to 1951 and at the Paddy Breeding Station, Coimbatore from 1951-'52 to 1955-'56. The results of these trials are discussed in this paper.

Materials and Methods: At Pattambi the experiments were conducted during the first and second crop seasons with the strains PTB. 2 and PTB. 20 respectively. The treatments consisted of the application of superphosphate at 150 lb. per acre (1) before final ploughing (2) after final ploughing and (3) no superphosphate, the other manure applied to the crop being green leaf at 5000 lb. and ammonium sulphate at 150 lb. per acre. The three treatments were randomised and replicated four times.

At Coimbatore the experiment was conducted in a modified form, the quantity of superphosphate applied being at the rate of 45 lb. P_2O_5 over a basal dressing of 5000 lb. of green leaf per acre plus a top dressing of 30 lb. of Nitrogen as ammonium sulphate one month after transplanting. The treatments were as follows:—

(1) Superphosphate spread on surface and puddled in by digging (2) Superphosphate made into a paste with mud and the roots of seedlings dipped in the paste before transplanting and (3) superphosphate applied by broadcasting at the time of planting (control). The lay out was in randomised blocks replicated eight times, the variety being Co. 25.

Results: The results of the trials conducted at Coimbatore and Pattambi are furnished in Tables I and II respectively. Table I gives the data regarding measurement of height, number of ear-bearing tillers, length of panicle and number of grains and chaff in the panicle. The data do not show any significant difference between

the three treatments though Treatment I shows a slightly increased length of panicle and less percentage of chaff. Similarly the yield data presented in Table I show no significant difference in grain yield while the difference in straw yield during one season alone has attained the level of significance, the surface application having recorded the maximum yield.

Table II which gives the results of the trial at Pattambi also does not show any significant difference between treatments though the trend is in favour of treatment I where superphosphate is applied before final ploughing.

Discussion: The results obtained from four seasons trials conducted at Coimbatore and Pattambi have not given any conclusive results. The differences in plant height, number of productive tillers and length of panicles do not give any clue except that the percentage of chaff in plots where the phosphate is dug in is less than that in the case of other treatments. The yield differences between the placement method and surface application are also not striking. The placement methods adopted in this experiment are either digging or ploughing in the superphosphate before transplanting or dipping the roots of seedlings with super and mud paste. In spite of placing the fertilizer so close to the root zone no appreciable differences in yield have been obtained. This leads to the conclusion that lack of response of the crop to phosphates may be due to the high fertility level of soils of the research station where systematically manuring is in vogue. According to Stewart (1952) and Cooke and Widdowson (1955) the benefits from placement are likely to be the greatest on soils which are deficient in available nutrients. On soils which have been adequately manured for many years placement is not likely to provide any such marked benefits. Hence it is suggested that trials conducted in ryots' holdings might give some indication of the effect of placement of this fertilizer.

Summary: Field trials conducted at Pattambi and Coimbatore to test the efficacy of the placement of superphosphate on the yield of rice during four seasons did not show any significant difference either with regard to yield attributes or to yield itself. It is concluded that the possible cause for the lack of response of the crop to phosphate might be due to the high fertility level of the soils of the research stations.

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TABLE I.

Treatments:

1. Basal dressing of 5,000 lb. of leaf plus 30 lb. Nitrogen as ammonium sulphate plus 45 lb. P_2O_5 as Super spread on surface and puddled in.
2. 5,000 lb. leaf as basal dressing plus 30 lb. Nitrogen as ammonium sulphate plus 45 lb. P_2O_5 as Super. The super is made into a paste with mud and the roots of seedlings are dipped in the paste before planting and the balance is applied to the plot.
3. 5,000 lb. leaf as basal dressing plus 30 lb. Nitrogen as ammonium sulphate plus 45 lb. P_2O_5 as super applied as top dressing at the time of planting.

Quantitative characters (Mean of 600 plants).

Particulars	Treatment I	Treatment II	Treatment III
Height of plant	2' 3"	2' 4"	2' 4"
Number of tillers per plant	8	7	8
(Mean of 200 plants)			
Length of Panicle in cm.	19.6	19.4	19.5
Number of grains per panicle	128	129	133
Percentage of chaff	3.3	3.7	3.8

Summary of Results for Yield - Grain.

Year	Particulars	Tr. 1	Tr. 2	Tr. 3	General mean.	S. E. (P=0.05)	F. Test
1951--52	Acre yield in lb.	2992	3104	3008	3035	87.9	Not satisfied
	Percentage on control	94.3	103.2	100.0	99.2	2.9	
1952--53	Experiment was not conducted due to the failure of the season.						
1953--54	Acre yield in lb.	3870	3801	3891	3854	69.2	Not satisfied
	Percentage on control	99.5	97.7	100.0	99.0	1.8	
1954--55	Acre yield in lb.	3489	3730	3723	3646	123.9	do
	Percentage on control	93.7	100.2	100.0	97.9	3.9	
1955--56	Acre yield in lb.	3575	3216	3423	3404	163.4	do
	Percentage on control	104.4	93.9	100.0	99.4	4.8	

TABLE I (Continued)

Year	Particulars	Tr. 1	STRAW		G. M.	S. E.	F. Test	Critical difference (P=0.05)
			Tr. 2	Tr. 3				
1951—52	Acre yield in lb.	6325	6407	6210	6314	157.8		Not satisfied
	% on control	102.0	103.4	100.0	101.8	2.52		
1952—53	Experiment not conducted due to failure of season.							
1953—54	Acre yield in lb.	8103	7964	8205	8091	161.8		Not satisfied
	% on control	98.8	97.1	100.0	98.6	1.97		
1954—55	Acre yield in lb.	5726	5559	6424	5903	159.4	Satis- fied	558
	% on control	89.1	86.5	100.0	91.9	2.48		7.5
1955—56	Acre yield in lb.	6841	6841	7025	6903	131.2		Not satisfied
	% on control	97.3	97.3	100.0	98.2	1.9		

TABLE II.

Agricultural Research Station, Pattambi.

Treatments:

1. Super phosphate at 150 lb. per acre before final ploughing.
2. Super phosphate at 150 lb. per acre after final ploughing.
3. No super phosphate.

Summary of Results.

Grain

Year	Particulars	Tr. 1	Tr. 2	Tr. 3	G. M.	S. E. P=0.05	F. Test
1948—49	Acre yield in lb.	2300	2360	2280	2313	68.7	Not satisfied
II crop	% on control	100.9	103.5	100.0	101.4	3.4	
1949—50	Acre yield in lb.	2210	2053	2123	2128	114.3	do
I crop	% on control	104.1	96.7	100.0	100.2	5.4	
II crop	Acre yield in lb.	2269	2350	2323	2314	120.3	do
	% on control	97.7	101.2	100.0	99.6	5.1	
1950—51	Acre yield in lb.	2329	2258	2258	2282	167.7	do
Ic rop	% on control	103.1	100.0	100.0	101.9	7.4	

Research NotesA Note on the total stem Parasite *Cuscuta hyalina*, Roth.

The occurrence of the total phanerogamic parasite *Cuscuta hyalina*, Roth., on some of the common weeds found on the bunds of the Guinea grass plot at the Sewage Farm, Avaniapuram (Madurai) is recorded here. While *C. reflexa* is a common parasite found in many species of hosts, this species is not a common one. This leafless twining parasite is easily made out by the very appearance of a mass of slender, yellow, elongated and thin stems with abundance of flowers. The plants attacked by the parasite are stunted in growth and sometimes gradually succumb to the attack. *Tribulus terrestris*, the common weed in the area, has been found to be attacked by the parasite severely. The author has also observed the following plants to be attacked by the parasite. They are *Abutilon indicum*, *Malvastrum coramendalianum*, *Acalypha indica*, *Euphorbia hirta*, *Tridax procumbens*, *Digera arvensis*, *Corchorus acutangularis*, *Commelina benghalensis*, and *Paspalidum flavidum*. In the year 1957, the author has noticed *Trianthema portulacastrum* and *T. decandra* attacked by the parasite. It has been previously recorded by Gamble growing on *Amaranthus*, *Ipomoea*, *Polygonum*, *Tribulus* and *Trianthema* spp.

The interesting feature of this parasite is that it has been found to be attached to the stem, petiole, leaf-lets, the pedicels of the flowers and on the fruits of the host plant by means of haustoria or suckers through which its nourishment is drawn. The parasite produces flowers in clusters and sets fruits. The parasite was found during this year more or less in the same area where it was noted in the previous year. The flowering and fruiting are profuse and considerable quantity of seeds are produced. From the observations made, it is found that it makes its appearance and multiplies rapidly with the receipt of good showers. The yellow, leafless stem elongates rapidly and *nutates* round and when it comes in contact with the host plant coils round it and produces haustoria which penetrate into the host. It makes its appearance by September and thrives till the summer when it dies out.

Acknowledgement: I am very grateful to Dr. D. Daniel Sundararaj, Syst. Bot. & Prof. Botany, Agricultural College and Research Institute, Coimbatore, for the valuable suggestions in the preparation of this note and for going through the manuscript.

District Agricultural Office,
Madurai.

B. VASANTHARAJ DAVID.

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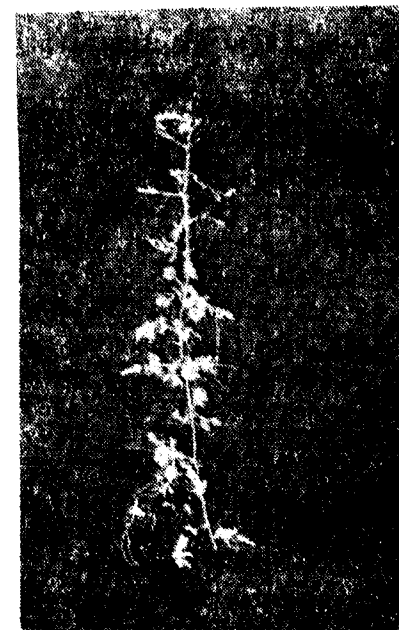


FIGURE:

Cuscuta hyalina on *Tribulus terrestris*.
Arrow at the centre indicates the
parasite on the fruit; arrow at the
bottom indicates the flowers of the
parasite.

OBITUARY.

We regret to announce the sudden demise of Sri C. V. Bashyam, son of late Dewan Bahadur C. V. Venkataramana Iyengar, at his residence in Coimbatore on 24-5-1959 at the age of 57.

He was a student of the early short course of the Agricultural College. He worked in several honorary capacities as, Vice-President of the Local Bench Court, Jail Visiter etc., He was a keen Agriculturist interested in Scientific Agriculture. He was a Patron of the Madras Agricultural Students' Union.

He was a good sportsman having helped to win trophies in Football and Hockey.

We offer our heart felt condolences to the members of the bereaved family.

A Note on the soil and Water samples of site for an Experimental Farm at Amaravathinagar.

In the Udamalpet taluk of the Coimbatore district, a dam has been constructed across the river Amaravathi for irrigation purposes. The lands which were under rainfed conditions will receive an assured water supply with the advent of this project. Whenever arid lands are brought under irrigation, it is necessary to conduct experiments to find out the best method of irrigation, suitable rotation to be adopted and the manurial schedule to be followed so that the most effective use can be made of the land and the water, and therefore the need for an experimental farm. Location of a farm in this area will be useful both for the ryots of the Amaravathi ayacut as well as to the ryots of the Parambikulam-Aliyar Project area.

In the tentatively selected site, there are both good and bad soils with depths varying from one to four feet. The problems to be tackled and solved in this farm will be widely applicable to the ryots' fields also. Therefore with a view to assessing the fertility status of the soils, four profile pits were dug and soil samples collected. The nature of the soil and profile descriptions are given below :—

The Nature of Soil Profile.

	Profile I	Profile II	Profile III	Profile IV
1½'	Red sandy clay loam	1' — Sandy loam	Red sandy loam	1' — Red sandy loam
		3' —		Dark sandy clay loam
	Weathering rock	Hard rock	Weathering rock	1' —
			4' —	Weathering rock

Profile I This has a very shallow soil cover and this soil consists of only one horizon in the soil cover with weathering rock below.

Profile II This has a still shallower soil cover compared to Profile I with hard rock below. This is a newly bull-dozed area.

Profile III This consists of one horizon in the soil cover with weathering kankar below.

Profile IV This consists of two clear horizons of soil, the surface containing red loamy transported soil and dark clayey loam below.

The analytical data are presented in tables I to III. The mechanical composition of the soil (Table I) indicates the sandy to slightly loamy nature of the area. The clay content is found to increase with depth. Chemical analysis (Table II) of the samples from Profile IV reveals the lack of plant nutrients, lime, phosphoric acid and potash. Nitrogen, however, is present in just sufficient quantities in the first three feet. Lime status is better in the fourth foot than the first three feet. Profiles I and III are very poor in nitrogen, while phosphoric acid, potash and lime are just sufficient. The second profile is rich in lime, moderate in potash and phosphoric acid and poor in nitrogen. On the whole the soils are of low fertility status and hence manuring for all the major nutrients is necessary for growing good crops.

Soil condition and reaction : The pH is found to increase with depth in Profile IV and clearly indicates alkalinity in the fourth foot of this profile and the other three profiles. The degree of alkalinisation is also in conformity with this and is considerable in the fourth foot of profile IV., But the soils have very low salt concentration even at lower depths (less than 0.1 percent). The soils have poor water holding capacity, but the pore-space is satisfactory, indicating free drainage. Hence the water requirement will be high. Even the slight alkalinity and presence of salts will not be harmful as the porous nature of the soil will allow free drainage and prevent any accumulation of salts. The montmorillinitic type of clay present is evident from the specific gravity of the soil.

The quality of water : Analysis of the sample of water taken from a well in the site shows that the total solids and sodium salts are within permissible limits specified for irrigation. Hence there is no fear of alkalinity developing in these soils by irrigating with this water. From the study it is possible to state that there does not appear to be any harmful salts which are likely to interfere with crop growth. With adequate manuring and assured irrigation it will be possible to grow good crops of cotton, ragi, cholam, chilly, paddy and sugarcane.

The authors are greatly indebted to Sri F. L. Daniel and Sri S. Varadarajan for their help and guidance in carrying out the laboratory analysis of the samples and also in the preparation of this short note.

M. INDIRA RAJA
N. KAMALAM
Dr. A. MARIKULANDAI

TABLE I
Mechanical Composition.

Samples	Prof 1 First foot	Prof 2 First foot	Prof 3 First foot	Prof 3 2nd foot	Prof 3 3rd foot	Prof 4 First foot	Prof 4 2nd foot	Prof 4 3rd foot	Prof 4 4th foot
Percent on moisture-free basis									
Clay	22.69	14.53	24.56	22.64	25.42	16.33	21.50	21.55	28.40
Silt	4.32	3.21	3.49	3.98	4.89	4.10	4.15	10.01	5.82
Fine sand	55.99	29.25	54.99	57.41	56.02	36.71	28.86	22.38	25.87
Coarse sand	13.95	44.15	14.14	13.72	11.49	41.36	45.10	42.36	39.22
Total	96.95	91.14	97.18	97.75	97.82	99.50	99.61	99.30	99.01
Acid solubles	3.05	8.86	2.82	2.25	2.18	0.50	0.39	0.70	0.09

TABLE II
Chemical Composition.

Sample	1	2	3	4	5	6	7	8	9
Percent on moisture-free basis.									
Moisture	3.38	2.65	4.05	4.52	4.92	2.66	3.66	4.17	5.66
Nitrogen	0.03	0.027	0.023	0.024	0.19	0.046	0.053	0.050	0.028
Total P ₂ O ₅	0.105	0.178	0.105	0.083	0.095	0.122	0.088	0.089	0.157
Total K ₂ O	0.38	0.44	0.44	0.31	0.38	0.041	0.044	0.044	0.045
Lime (CaO)	0.62	3.44	0.47	0.47	0.72	0.24	0.24	0.38	1.13

TABLE III
Alkalinity

pH	1	2	3	4	5	6	7	8	9
	8.7	8.7	8.8	8.5	8.9	7.8	7.9	8.3	8.9
Total solids %	0.056	0.038	0.052	0.044	0.062	0.048	0.068	0.085	0.095
Carbonate %	..	..	..	..	..	..	..	..	..
Bicarbonate	0.034	0.028	0.035	0.023	0.043	0.008	0.008	0.012	0.021
Chloride %	0.004	0.004	0.004	0.004	0.004	0.002	0.003	0.002	0.004
Degree of alkalini- sation	0.39	2.35	7.87	5.86	5.69	..	..	..	..

Our Distinguished Visitors



PANDIT JAWAHARLAL NEHRU, Prime Minister of India, laid the foundation stone of the Auditorium and inaugurated the Golden Jubilee building on 29th May 1959.

College and Estate News

Refresher course in Soil Science: The refresher course in Soil Science and Agricultural Chemistry for Agricultural Chemists and Professors from various States was inaugurated on the 18th May by Sri M. Bhaktavatsalam, Minister for Home and Agriculture. A similar refresher course in Agricultural Engineering was held at Allahabad to which Sri S. E. Anantaraman, Agricultural Engineer and Professor of Agricultural Engineering was deputed.

Officers' Club: Sri K. Ramaswami, former Paddy Specialist to the Government of Madras, delivered a talk on "Gambia" under the auspices of the Officers' Club.

Tours: The students of the Horticulture Faculty of the M. Sc. (Ag.) class went to Ootacamund on the 16th May to witness the Flower Show.

University Examinations: The final B. Sc. (Ag.) degree examinations of the University of Madras, were held from the 20th May.

Scholarships to M. Sc. (Ag.) Students: Sri E. Padmanabhan Nambiar, K. K. Vidhyadharan, Narayanan Namboodiri and P. C. Jose have been awarded study allowance of Rs. 150/- each per month by the Government of Kerala, Sri S. R. Sreerangaswami, Aravindaksha Menon, A. Venkata Rao and P. C. Meenashisundaram have been awarded fellowships of Rs. 150/- each per month by the Indian Council of Agricultural Research.

A Report on Improvement of Indigenous and Imported Implements and their Popularisation

Survey of indigenous implements:

The survey of indigenous agricultural implements in the country was sponsored by the I. C. A. R. through the Division of Agricultural Engineering of the I. A. R. I. in 1954. The total number implements surveyed which have different designs and construction are 552. These implements can be grouped as under:

No. of Implements collected and tested:

<i>Different designs of Implements</i>							
Ploughs	Harrows	Hoes	Seed-drills	Planks & levellers	Rollers	Ridgers	Sickles
192	87	83	100	14	40	11	25

The various States from which these implements were collected are shown in the detailed statement (Appendix I). There is a wide variety of ploughs which are used in different parts of the country. The shape and the design of these ploughs varies in relation to the soil type. The farmers have made these modifications to suit their own conditions of cultivation. It is only in Hyderabad and Bomba

State (pre-Reorganization) that the number of the type of burrows is very large. In other States this number is not so great. A similar situation is observed with regard to hoes and seed-drills. The variations in seed drills are also very large in the State of Madhya Pradesh. In other implements such as sickles, levellers, rollers and ridgers the variation is not so very distinct.

Foreign imported implements :

In 1950-51 a set of improved Japanese implements and machines was obtained from Japan. The ones found very useful for adoption in this country are the pedal-operated paddy thresher and the rice-land weeder. In several parts of the country these implements are now being adopted by the farmers. Various conditions. The Japanese weeder has been very considerably modified at the Agricultural Research Station, Karjat and the new model has been given out on very extensive scale through the Bombay Department of Agriculture.

Out of the implements collected after survey and from the imported implements the implements found very suitable for popularization to the farmers are given as under :

Particulars	Name of Implement
Paddy	1. Rice-land weeder
	2. Wet-land puddler
	3. Duck-foot Orissa plough
	4. Pedal-operated paddy thresher
Wheat	1. Olpad thresher
	2. Guntaka (ho)
	3. Power thresher (Punjab thresher)
	4. Band former
Cotton	1. Cotton seed drill
For Processing	1. Hand-operated paddy sheller
	2. Rice huller
	3. Rice polisher
	4. Ground-nut decorticator

The drawings of these implements are supplied by the Division of Agricultural Engineering to the various concerns for manufacture of these implements on a large scale. A Buyers' Guide for Agricultural Implements prepared in the Division has been published by the Indian Council of Agricultural Research for circulation to all interests in the implement-manufacturing industries and for the use of interested farmers. The Institute has also published a large number of articles in 'Indian Farming' and other popular journals to guide the farmers who wish to purchase improved implements for use.

In appendix II is given a list of 48 types of implements which have been recently imported from abroad and which have some special feature superior to the indigenous implements. Their details are shown as under :

Ploughs	
Cultivators	4
Fork	20
Spade	1
Pulverisers	2
Seeders	2
Fertilizer Placement machine	1

Implements and their Popularisation

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Mower	1
Scythes & its attachments	8
Groundnut decorticator	1
Maize sheller	1
Chaff cutter	1
Hammers	2
Total	48

The testing of these implements is in progress.

Museum :

Most of the implements and machines collected from the country and abroad are now on display in the Agricultural Museum set up for the purpose of display at the Indian Agricultural Research Institute. It is proposed to prepare some descriptive literature and a catalogue for distribution to the visitors in the near future. Every year several thousands of the farmers who came round the Institute as a part of "Bharat Darshan" will be taken round through this museum to show them the implements which are popular in different states and which they could adopt for use in their own states. Queries are answered from the interested parties and all required information is supplied to them in respect of these implements.

Research & Development :

The research on the development of new machines was taken in hand in 1952. Machines which have already been developed are as follows :—

Name of implements	Developed in
1. Rotary compost or manure screen	1952
2. Groundnut decorticator	1953
3. Jute Seed-drill	1953
4. Groundnut planter	1953
5. Winnowing fan	1956

The blue prints of these machines have been supplied to various concerns so that they could be adopted for manufacture on a large scale. Besides development work on the various implements which are likely to be of use to the farmers is further in progress. The implements which are being tested and developed are as under :—

1. Improved Argadha Seed-drill.
2. Fertiliser placement-com-sowing machine.
3. Bullock-operated seed-drill.
4. Standardisation of Mould-board ploughs.
5. Bullock gear.
6. Single Bullock hitch.
7. Appliances and devices for using cow-dung gas.
8. Small H. P. engine for the use with cow-dung gas.

The research on these implements is in an advanced stage of development. The development of small H. P. engine for use with a gas plant to run on cow-dung gas will be a great advance on the work so far conducted anywhere. The preliminary research shows much promise. Some of these projects are of fundamental nature, such as standardization of mould board ploughs. They require

the study of mechanics of the soil and the geometry of the mould-boards which would enable us to fabricate mould-board ploughs for soils containing different amounts of clay and sand as their physical constituents. In India the use of fertilisers is becoming very popular. Most of the farmers broadcast the fertiliser and do not place it properly in the vicinity of the seed to get the maximum advantage out of the fertiliser. For this purpose a fertiliser placement-cum-sowing machine is being developed. There are various models of this machine which are available in foreign countries but their capital cost is very high and require a large amount of power. It is, therefore, essential to develop a simpler but very effective machine to suit Indian conditions.

Popularization of Implements:

The implements of which the manufacture has been taken up on a very large scale in the country is as follows:—

1. Fodder cutters.
2. Seed drills.
3. Cane crushing mills.
4. Mould-board ploughs.
5. Iron Persion wheel with a system of ball bearing.
6. Olpad thresher.
7. Japanese weeder.
8. Triphali (3 tined hoe).
9. Hand winnowers.

Some of these implements are being manufactured in thousands. The accurate record of the manufacture of these implements is maintained by the Development Wing of the Ministry of Commerce & Industry which issues steel quotas to the manufacturing firms as well as for hand tools and implements requiring small power to the village artisans and small-scale industries.

Under the Second Five Year Plan, Implement Stores and Workshops are being set up in all the Development Blocks where improved implements would be stocked and repaired. The farmers have already started taking advantage of this development in areas where these Implement Stores and Repair Workshops have been set up. As time elapses more and more of these facilities will be available to the farmers of the country.

[From the Under Secretary I. C. A. R., Letter No. 11 (28)/58, dated 2-12-1958].

Weather Review — for April, 1959.

RAINFALL DATA (IN INCHES)

Division	Station	Total rainfall for the month	Departure from normal	Total since 1st January 1959
North	Madras (Meenambakkam)	0.3	— 0.2	1.3
	Tirurkuppam*	1.0	+ 0.1	1.8
	Vellore	0.2	— 0.8	4.0
	Gudiyatham*	1.8	+ 0.4	4.1
East Coast	Palur*	3.8	+ 3.2	4.8
	Tindivanam*	0.2	— 0.9	4.1
	Cuddalore	0.5	— 1.1	2.5
	Nagapattinam	1.4	— 0.6	1.8
	Aduthurai*	1.3	0.0	1.8
	Pattukkottai*	1.6	— 0.1	3.8
Central	Salem	2.8	+ 0.7	6.2
	Coimbatore (A. M. O.)*	0.9	— 1.5	1.3
	Coimbatore	0.5	— 1.0	0.8
	Tiruchirapalli	5.5	+ 3.7	5.9
South	Mathurai	2.8	+ 0.7	5.1
	Pamban	1.1	— 0.7	2.8
	Koilpatti*	4.7	+ 2.0	6.9
	Palayamcottai	5.1	+ 2.7	6.8
	Ambasamudram*	6.8	+ 3.8	9.1
	Nagercoil*	3.6	— 0.4	5.0
Hills	Kodaikanal	3.9	— 0.9	5.8
	Coonoor*	4.3	— 1.0	6.2
	Ootacamund*	1.8	— 1.8	1.9
	Nanjanad*	2.0	— 2.1	2.0

* Meteorological Stations of the Madras Agricultural Department.

A low pressure area lay over northwest Orissa and neighbourhood on the first day of the month and became unimportant on the very next day. Weather was mainly dry in the Madras State on the first three days of the month. An easterly wave was apparently moving across southwest Bay of Bengal on 5-4-'59 and this moved away westwards across the Comorin-Maldives area on the following day. On 6-4-'59 itself a shallow trough of low pressure existed over the east central Arabian Sea, off the Konkan and Kanara coasts, but this became less marked on 7-4-'59. Showers were scattered in south Madras on 4-4-'59 and 6-4-'59, and occurred locally in the Madras State on 5-4-'59 and 7-4-'59. They were fairly widespread in south Madras and scattered in north Madras on 8-4-'59.

A low pressure area lay over the Comorin-Maldives area on 9-4-'59 and this passed away westwards across the southeast and the adjoining southwest Arabian Sea on 10-4-'59. Showers occurred in a scattered manner upto 13-4-'59. Dry weather prevailed throughout the Madras State on the following two days. Due to the passing of a western disturbance over the Punjab (P) there was incursion of moist air over the Peninsula on 16-4-'59, resulting in scattered showers in south Madras. Under the influence of two western disturbances passing over North India on 17-4-'59, moist air prevailed in most parts of the country, and rainfall increased in the Madras State. A low pressure area lay over the Gulf

of Oman on 18-4-'59, but became less marked on the succeeding day. Rainfall occurred at a number places in the Madras State on these two days and showers occurred locally on 20-4-'59. This rainfall helped to abate the severity of summer and the day temperature was below normal in south Madras on 21-4-'59. Thereafter, dry weather prevailed upto the end of the month, except on 23-4-'59 and 24-4-'59, when rainfall occurred at a few places in Madras State.

The noteworthy rainfalls for April-'59 are furnished hereunder :—

Noteworthy rainfalls

No.	Date	Name of place	Rainfall in inches
1.	4-4-1959	Ambasamudram	2.56
2.	7-4-1959	Coonoor	1.57
3.	20-4-1959	Palayamcottai	1.65
4.	24-4-1959	Tiruchirapalli	1.73

Zonal rainfall (in inches)

Name of Zone	Rainfall for April, 1959	Departure from normal	Remarks.
North	0.8	- 0.1"	Just below normal
East Coast	1.5	+ 0.3"	Just above normal
Central	2.4	+ 0.5"	"
South	4.0	+ 1.4"	Above normal
Hills	3.0	- 1.5"	Below normal

Agricultural Meteorology Section,
Lawley Road Post, Coimbatore-3.
8th May, 1959.

C. B. M., M. V. J. & R. V.

Departmental Notifications

Gazetted Officers—Madras Agricultural Department.

Postings and Transfers during the month of May 1959.

Name and Designation	Posted or Transferred to
Sri K. M. Sundaram, Seed Development Officer, Tanjore.	Earned leave for 13 days from date of relief reported to the same post on return from leave.
„ C. Ratnam, Asst. in chemistry	Posted as Asst. Agrl. chemist, Coimbatore
„ T. A. Govinda Ayyar, Ty. Asst. Agrl. Chemist, Coimbatore	Ty. Soil Survey Officer, Coimbatore
„ N. G. Narayanan, Certification Officer, Rajapalayam	Earned leave for 25 days from 6-5-1959 to 30-5-1959.
„ P. N. Krishnaswami, Gazetted Asst. Rajapalayam	Addl. charge of the post of Certification Officer, Rajapalayam
Dr. S. Krishnamoorthy, Horticulturist and Professor of Horticulture, I. A. R. I., New Delhi	Act on probation as Principal A. C. R. I., Coimbatore, Vice Dr. A. Mariakulandai, reverted as Professor of soil Science.
Dr. S. Kanakaraj David, Lecturer in Entomology, Coimbatore	Earned leave for 13 days from 27-4-1959 to 9-5-1959
Sri T. T. Santhanaraman, Additional Lecturer in Entomology, Coimbatore	Addl. charge of the post of Lecturer in Entomology, Coimbatore
„ T. N. Balasubramaniam, Cane Dev. Officer, Tiruchirapalli	L. A. P. for 10 days from 5-5-1959 to 14-5-1959 A. N.
„ N. R. Adyanthiah, Crop & Plant Protection Officer, (Mycology) Coimbatore	Earned leave for 51 days from 11-4-1959 to 31-5-1959 A. N.
„ M. Bhavani Sankar Rao, Vice-Principal, A. C. & R. I., Coimbatore	On retrenchment of the post of Vice-Principal, transferred as Oil Seeds Specialist, Coimbatore
„ S. G. Ayyadurai, O. S. S., Coimbatore	Reverted as Assistant Oilseeds Specialist, Pollachi
„ N. Srinivasalu, Asst. Oil Seeds Specialist, Pollachi	Reverted to the Madras Agrl. Subordinate Service
Kumari I. P. Janaki, Assistant in Entomology, Coimbatore	Act as Assistant Entomologist
Sri T. R. Subramaniam, Do. Do.	Do. Do.
„ R. Soundararajan, Lecturer in Chemistry, Coimbatore	Act temporarily as Reader in Soil Science, Regional Post Graduate Research Institute, Coimbatore

Name and Designation	Posted or Transferred to
Dr. A. Mariakulandai,	Earned leave for 30 days from date of relief
Sri N. Ranganathachari, Lecturer in Agriculture, Coimbatore	Earned leave for 15 days from date of relief
„ T. B. Krishnaswamy Rao, Asst. Cotton Extension Officer, Madurai (on leave)	Extension of earned leave for 30 days from 9—5—1959
„ K. P. Sanjeeva Shetty, Asst. Agrl. Engineer, Soil Conservation scheme, Coonoor	Earned leave for 15 days from date of relief

Upper Subordinates—Agricultural Department

Postings and Transfers during the month of May 1959.

Name and Designation	Posted or Transferred to
Sri K. Nagappan, Asst. in Entomology A. C. & R. I., Coimbatore.	Asst. Lecturer in Entomology A. C. & R. I., Coimbatore
„ S. Vijayaraghavan, Asst. Lecturer in Entomology A. C. & R. I. Coimbatore	Asst. in Entomology A. C. & R. I., Coimbatore
„ M. Balachandran, Asst. in Mycology A. C. & R. I., Coimbatore	Asst. Lecturer in Mycology A. C. & R. I., Coimbatore
Kumari Sarojini Damodaran, Assistant Lecturer in Mycology, A. C. & R. I., Coimbatore	Assistant in Mycology, A. C. & R. I., Coimbatore
Sri Ramanathan, Asst. in Chemistry A. C. & R. I., Coimbatore	Asst. Lecturer in Chemistry, A. C. & R. I., Coimbatore.
„ S. Palaniswamy, Extension Officer, for Agriculture, Achalpuram, Anai-karanchatram, Tanjore Dt.	Asst. in Paddy, A. C. & R. I., Coimbatore
„ A. R. M. Ramanathan, Chemistry Asst. Coimbatore	Resignation accepted from 28—4—1959 A. N.,
„ M. Aravindaksha Menon, Farm Manager, State Seed Farm Veerakersalam	Resignation accepted from date of relief

DISTRICTS

SOUTH ARCOT, NORTH ARCOT
COIMBATORE
RAMANATHAPURAM
TIRUNELVELI



CROPS :

GROUNDNUT, GINGELLY
COTTON
&
TOBACCO

Review of market conditions of commercial crops in the notified areas for the month of April, 1959.

Cotton : In this section, lint : Candy of 784 lbs.

Kapas : Pothi of 280 lbs.

Tirupur : Coimbatore District : Season : The weather continued to be hot and dry. The rainfall received during the month was reported to be helpful to cotton crops.

Arrivals and transactions : Lint : The lint market started with an opening balance of 5885 candies of Cambodia and 386 candies of Karunganni lint. The total arrivals into Tirupur during the month were 8984 candies of Cambodia and 1919 candies of Karunganni lint which included 2832 candies of Cambodia and 931 candies of Karunganni lint locally ginned. Despatches from Tirupur were 6900 candies of Cambodia and 981 candies of Karunganni lint. At the end of the month there was a closing balance of 7969 candies of Cambodia and 1627 candies of Karunganni lint.

Kapas : The kapas market started with an opening balance of 31441 pothis of Cambodia and 1541 pothis of Karunganni kapas. The total arrivals into Tirupur during the month were 56877 pothis of Cambodia and 15278 pothis of Karunganni kapas. The disposals during the month were 58553 pothis of Cambodia and 8713 pothis of Karunganni kapas. At the end of the month there was a closing balance of 29765 pothis of Cambodia and 8106 pothis of Karunganni kapas.

Prices : The average prices of Cambodia and Karunganni lint during April, 1959 and March, 1959 were as follows :

Prices: The following were the price range of groundnut pods, kernels and oil in different markets in the State during the month compared to previous months.

	April, 1959.	March, 1959.
Groundnut pods (per bag of 80 lb.) ...	17—20.50	N. A.
Groundnut kernels (edy. of 531 lbs.) ...	163—176	N. A.
Groundnut oil (per edy. of 500 lbs.) ...	325—345	N. A.
Groundnut cake (per St.maund.) ...	10—12	N. A.

Ramanathapuram District: Arrivals and transactions: The following were the arrivals and disposals of groundnut pods and kernels in the district during the month.

	Opening stock	Arrivals	Disposals	Closing stock
Pods (in tons). ...	...	...	...	...
Kernels (in edy. of 531 lbs.) ...	3140	...	2000	1140

Prices: The following were the prices of pods, kernels, oil and oil cake during the month compared to previous month.

	April, 1959.	March, 1959.
Groundnut pods (bag of 80 lbs). ...	...	N. A.
„ kernels (edy. of 531 lbs). ...	170—185	160—183
„ oil (edy. of 500 lbs). ...	334—336	295—315
„ oil cake (St. Maund of 82 2/7 lb). ...	10.03—12.70	9.36—12.37

Gingelly: (In this section bag is 168 lbs.).

The arrivals of gingelly accounted for 700 bags of 168 lbs. each, out of which 229 bags received from Trichy district. Despatches amounted to 9 bags. The consumption by mills and chekkus came to 38 bags and 502 bags respectively: The trade was left with a stock of 598 bags at the close of the month.

The average price per bag of 168 lbs. varied from 60.30—67.72 according to quality.

Tobacco: (In this section candy is 500 lbs.).

Coimbatore District: The harvest of tobacco in Coimbatore district has almost been completed.

There was a stock of 10,070 candies of chewing and 135 candies of cheroot tobacco. About 2820 candies of chewing and 85 candies of cheroot tobacco were exported to Tanjore, North Arcot, South Arcot, Madurai, Salem etc., in Madras State and to places to Andhra and Mysore States.

The prices ruled steady around the level of the previous month.

Price in Rs. per candy of 500 lbs.

Variety	I Grade	II Grade	III Grade
1. Chewing tobacco (Sun-cured):			
(a) Meenampalayam	330—450	250—320	150—225
(b) Other varieties	260—340	185—260	115—180
2. Cheroot varieties:			
Sun-cured grown in Erode and Bhavani taluks	270—340	245—265	175—220
3. Chewing tobacco:			
Pit-cured grown in Palladam and Sular areas	250—265	150—220	80—140

Cardamom: Madurai District: There was light rainfall in scattered places in the plantation areas. The standing crops were reported to be good. Picking and curing of fruits were in progress in Madurai district.

Prices were reported to be steady, despatches, from Bodinaickanoor continued to North India States as usual.

The following were the estimated arrivals and despatches of Cardamom in the important markets during the month.

Name of assembling centres	Opening stock	Arrivals	Disposals	Closing balance.
1. Bodinaickanoor ...	40,000	20,000	17,000	43,000
2. Thevaram ...	21,000	10,000	3,000	28,000
3. Pannaipuram ...	12,000	1,000	10,000	3,000
4. Kombai ...	12,000	1,000	3,000	10,000
5. Uthamapalayam ...	6,000	1,000	2,000	5,000
6. Cumbum ...	6,000	10,000	10,000	6,000
7. Gudaloor ...	16,000	2,000	9,000	9,000
8. Pattiveeranpatti ...	4,000	37,000	32,000	9,000
9. Virudhunagar ...	21,000	20,000	22,000	19,000

The following were the prices of Cardamom in different markets during the month.

Name of the quality:	Price per lb.
1. Bodinaickanoor:	
1. Special	Rs. 10.07
2. Superior Bulk	„ 9.56— 9.57
3. Medium Bulk	„ 8.81— 9.06
4. Inferior Bulk	„ 7.58
5. Seed or rice	„ 9.27—10.50
6. Local patches	...

MARKETING AGMARK PRODUCTS

The following articles are at present graded in accordance with the provisions contained in the Agricultural Produce (Grading and Marking) Act, 1937 by the authorised Agmark Packers of the State as per the list published in the Madras Agricultural Journal, November 1958.

1. Agmark rice (a) Par boiled varieties (b) Raw varieties.
2. „ ghee
3. „ potatoes
4. „ gingelly
5. „ groundnut oil
6. „ eggs
7. „ oranges
8. „ sandalwood oil
9. „ jaggery

The following is the list of stockists of authorised Agmark packers in Madras State in addition to the list published in this Journal Vol. 43, No. 11 of November 1958.

Rice :

1. Messrs. Murugan Chettiar & Co.,
Thillai Nilayam, Rice Mills,
Annamalainagar Post, Chidambaram,
South Arcot District.
2. Sri A. M. K. Gnanasambandar, Rice Mill,
Achalapuram Road, Coleroon,
Anaikanchatram Post,
Tanjore District.
3. Messrs. M. M. S. K. Ramaswamy Chetty & Co.,
Krishna Rice Mill,
Tiruppur.
4. Secretary,
Tanjore Co-operative Marketing Federation Ltd.,
Vijayapuram, Tiruvarur.

Ghee .

1. Sri P. M. Krishnaswami Naicker,
Butter and Ghee Merchants, Solaiseri,
Tirunelveli District.

Potatoes :

1. Sri A. P. Kanniappa Chettiar,
Merchant and contractor,
Cuddalore O. T., South Arcot District.

Market Agmark Products

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Gingelly Oil :

1. Messrs East Asiatic Co., Private Ltd.,
18, Ellaiya Mudali Street, Madras.
2. Messrs. T. V. Angappa Chettiar,
Ghee and Oil Merchant,
Kangayam, (Via) Erode.

Eggs :

1. Sri S. Govinda Pillai,
No. 60, Trichy Main Road,
Dodagapatti, Salem.
2. Sri A. P. Kanniappa Chettiar,
Merchant and contractor,
Cuddalore O. T., South Arcot District.
3. Secretary,
Fothi Nilayam Farm,
Muttathur, Villupuram Taluk,
South Arcot District.
4. Sri A. K. Ibrahim Rowther,
Egg Merchant,
15/76, Perumal Street,
Variety Hall Road, Coimbatore.

Oranges :

1. T. Sadaya Pillai, Contractor,
Government Hospital,
No. 2, Muniappa Koli Street,
Gogai, Salem.
2. Sri T. G. Palani,
Mangoes and Fruit Commission Agent,
Market, Vellore, North Arcot District.
3. Sri S. Govinda Pillai,
Contractor, Dodagapatti,
No. 60, Trichy Main Road, Salem.

Jaggery :

1. The Grama Urpathiyalar Varthaga Corporation, Ltd.,
Jaggery Merchants,
No. 279, Ramnad Road, Madurai.
2. Messrs. Nakendra Kumar Iswarlal & Co.,
Jaggery Merchants,
Chinnakadai Street,
P. B. No. 29, Tirupattur,
North Arcot District.



The Madras Agricultural Students' Union.

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1. Dewan Bahadur C. Arumachala Mudaliar, Zamindar of Chunnampet, Chunnampet P. O.
2. Raja Sri Krishnachandra Gajapathi Narayana Dev, Parthakimidi P. O.
3. Sri V. C. Palaniyandam Gounder, M. L. A., Vellaikinar, Coimbatore Dist.
4. Dr. C. P. Ramaswami Iyer, Ootacamund
5. Sri Jeevandass, Varnasi, Parthakimidi P. O.
6. Sri Ramachandra Ananga Bhima Dev, Kesari Gajapathi, Raja Sahib of Budokhemidi, Berhampore, Ganjam Dist.
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18. " M. Subba Rao B. Sc., (Ag.) Mango Range, P. O. Nilgiris
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23. " S. N. Venkataraman, B. A., B. Sc. (Ag.), Retd. Deputy Director of Agriculture (H. Q.), 33, Third Main Road, Gandhinagar, Madras
24. Dr. T. S. Sadasivan, Director, Botany Laboratory, Madras University, Triplicane, Madras-5
25. Sri W. P. A. Soundara Pandian, Pattiveeranpatti, P. O., (Via) Kodai Road
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28. " V. P. K. Kanyarohanam Pillai, Agriculturist & Businessman, Nagapattinam
29. " A. K. Subramania Odyar, Mirasdar, Athur Village, Namailam Taluk
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32. " M. Arumachalam, B. Sc., (Ag.), C. O. Sri Muthumara Reddiar, Pagandai Village P. O., (Via) Panrutti
33. " S. D. Rama Reddiar, Purnasugaipalayam P. O., (Via) Pallianellur, Villupuram
34. " S. Kothandapani Pillai, Purnasugaipalayam, Pallianellur, P. O., Villupuram
35. " G. Venkatammni, B. Sc., (Ag.), Partner, Mysore Fertiliser, 34, North Beach Road, Madras
36. " G. K. N. S. Nagarajan, Valavanoor, S. Arcot Dist.
37. " D. Konda Reddiar, Municipal Chairman, Villupuram, S. Arcot Dist.
38. " V. Sarangapani Gounder, M. L. A., Mirasdar, Maharaajapuram, (Via) Villupuram East P. O., S. Arcot Dist.
39. " R. Subramania Reddiar, Mirasdar of Ivelpet, P. O., Villupuram Taluk
40. " G. Govindan, Proprietor, Ramson & Co., Madras
41. " G. K. N. S. Bhaskaran, Valavanoor, S. Arcot Dist.
42. " K. Santhanam, Suvarnavar, Villupuram
43. " S. Sivasankaran Chettiar, Land Lord & Merchant, No. 2, Big Kannara Street, Mayuram, Tanjore Dt.
44. " K. M. Venkatachalam, Dip. Econ., 16, Cheekalingam Pillai Street, Chidambaram.
45. " S. Ramamurthy Iyer of Kunnam, Land Holder, Kunnam House, Sirkali, Tanjore Dist.

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.

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Coimbatore, }
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V. Subbiah,
Secretary.