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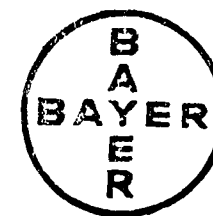
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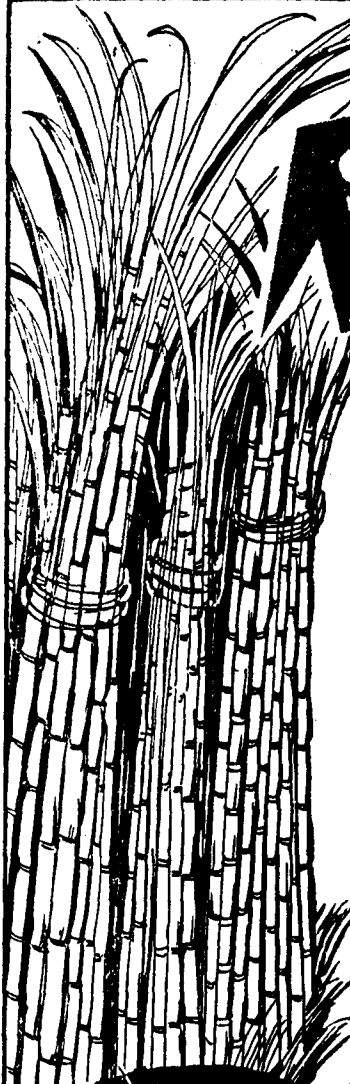
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Editorial

Leo Tolstoy's tale on "Much Land" showed that man's ambition in attaining a ceiling in land-holding has no limit. Acquisition of territory or land has been man's foible, be he Prince or Pauper. From time to time, wars and revolutions have come to level up the high and the low in land wealth. In India, we see in recent years quite a spate of legislation to smoothen out the incongruities that have arisen in course of time through man's ambition to acquire more and more land. In working towards the goal of the Welfare State, both the Central and State Governments of India have given great prominence to Land Reform. Zamindaries, Jagirdaries and other intermediaries have been abolished through Legislation. Attention was subsequently focussed on the elimination of absentee land lordism, on security of tenant and on fair rent. Laws incorporating these reforms have also come to be passed in some of the States in India. In Madras, the T. N. C. C. Subcommittee has again brought Land Reforms into head lines by their recent recommendations on ceilings of individual land holdings. The Travancore-Cochin Government have already gone ahead in this reform. There has been a large volume of opinion expressed for and against this reform in limiting the area of land an individual can possess and cultivate. Those against the reform have put forth the easy question as to why a limitation in land-holding alone should be made, when there is no limitation to the houses, cattle, vehicles, cinemas, mills and above all to the money and the jewels that one can possess. To them this reform seems to be an invidious distinction made against one type of asset. The others standing for the reform have countered this by arguing that Land as a form of asset is limited and is fixed and constant at all periods and for all times, unlike the industrial enterprises and other assets and hence should not be concentrated with a few but be shared by many.

Be that as it may, it is our considered opinion that the real malady of the country is in the small fragmented holdings. The

total cultivated area in this country is estimated at 249 million acres and according to the Planning Commission, land-holdings ranging from 25 to 100 acres comes up to 9 percent of the total agricultural area, after the abolition of the Zamindaris. The bane of the country now is not therefore the large holdings but the "toy and dwarf holdings", which have resulted due to the pressure of the population on the available arable land. According to the recent census figures issued by the Deputy Registrar General of India, 69.8 per cent of India's population are dependent on Agriculture. Of this, 28.5% are self-supporting, 12.5% partly supporting but the bulk 59% are non-earning dependents holding on to Agriculture. Any progressive land reform therefore should first and foremost aim at consolidation of the subdivision, which has resulted through the ages. The class of people grouped as non-earning dependents and who form the bulk of the people in the Agricultural group should be taken out of the land and put to other avocations and their fragmented holdings consolidated. The day is not however far off when with the increase in Industries contemplated in the next Five Year Plan, we should be able to reduce the bulk of the people now dependent on Agriculture and thereby reduce the present pressure on the land.

The Effect of Chemicals on the Growth and Mitosis in *Sesamum Orientale* Linn (Til or Gingelly)

by

K. RAMANATHAN

Botany Department, Birla College of Science, Pilani (India)

Introduction: Drugs containing alkaloids are known for their outstanding physiological activity which is based partly on their antibiotic properties, and partly on the inhibition and poisoning of important physiological processes. Since the discovery of Colchicine by Blakeslee & Avery (1937) on the effectiveness of this drug as an agent for inducing chromosome duplication, much work on the effect of allied chemicals on the nuclear cycle has been reported. A review of the recent literature shows that a number of workers have been investigating the various aspects of the different chemicals like colchicine, Acenaphthene, Coumarine, Sulpha-drugs etc. and also the effect of growth promoting chemicals with regard to their activity on the mitosis, growth and cell development. This paper deals with the preliminary observations made during the investigations on the cytological effects of chemicals on the roots of *Sesamum orientale* L.

Material and Methods: Seeds of *Sesamum orientale* with black, brown, white and dull white coloured varieties were taken for study. The chemicals used are:— acenaphthene, α -naphthalene acetic acid. The concentrations used were 1000 p. p. m. (0.001%), 100 p. p. m. (0.0001%) and 10 p. p. m. (0.00001%) aqueous solution for 24 and 48 hrs. duration.

Seeds of *Sesamum* were grown on moist filter paper in petri dishes until the roots attained a sufficient length for handling. They were then transferred to solutions of different concentrations. Only the roots were actually immersed in the solution. After the required period of treatment, the roots were retransferred to distilled water and carefully washed with water so that the surface of the roots was free from the solution.

The root tips at the end of the treatment, either immediately or after keeping them in distilled water for 24 hrs. were fixed in alcoholic fixative (Acetic Alcohol 1:3). In all the cases only root tip squashes with Feulgen and acetic-orcein were employed.

Observations: (I) EFFECT OF CHEMICALS ON MITOSIS: (a) *Acenaphthene treatment:* When root tips of *Sesamum orientale*

were subjected to acenaphthene treatment at the different concentrations mentioned above for 24 and 48 hrs. duration, no significant effect was noticed in their growth and they were very similar to the control seedlings. But in a few cells there was slight disturbance in mitotic cycle in that there was ineffective cleavage and abortive spindle formation. Nebel (1937), Kostoff (1938) have shown that a saturated solution of acenaphthene is effectively used as polyploidising agent in *Allium* and *Lilium*. So a saturated solution of this was applied to the roots and the treatments were given for 24 and 48 hrs. Even then no marked effect was produced by the chemical. The treated seeds were planted after carefully washing in water in small pots in order to observe whether any mutations would be produced. But none of the seedlings survived till the flowering stage. It has been inferred that *Sesamum* plants are not susceptible to the effect of acenaphthene.

(b) α -Naphthalene Acetic Acid (NAA) & β -Naphthoxy acetic acid treatment: When the roots were treated with solutions at very low concentrations such as 0.00001% there is an appreciable increase in the mitotic rate, as compared to the control and there is stimulation of the growth of the roots. But at a higher concentration 0.0001% there is definite disturbance in the mitotic cycle. While many cells exhibited normal mitosis, in about 40% of the cases mitotic aberrations were seen.

The chromosomes of a cell undergoing mitosis remain scattered at metaphase instead of being arranged at the equatorial plate. The spindle if already formed at the time of treatment breaks down and the chromosomes do not show movement. Thus in the first stage of mitosis the chromosomes may be seen either scattered or in arrested metaphase or early anaphase positions without being separated. Some degree of contraction of chromosomes also takes place at this stage. The chromosomes then slowly pass into the interphasic condition and affected cell may contain either a single tetraploid nucleus or several nuclei with varying chromosome numbers. Arrested mitosis at anaphase may give rise to cells containing two normal diploid nuclei through failure to develop a complete dividing wall. The paired chromatids are frequently to be seen resulting in restitution polyploid condition. Chromosomes run together to form large, deeply staining pycnotic masses. The cells with high polyploid chromosome numbers were greatly enlarged in size and the walls were sometimes considerably thickened.

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When the roots were treated with solution of 0.0001% concentration there is a complete cessation of mitosis and an increase in the size of the nucleus and nucleolus. Further it is noticed that the time factor is not of so much consequence as the factor of the chemical used. But the experiments conducted by other workers show that at any concentration the number of 'metaphases' increases with lengthening treatment and with higher concentrations, reaches a maximum and then falls as nuclear disintegration takes place.

(c) Phenyl acetic acid (PAA) treatment: The effect of phenyl acetic acid on mitosis in the cells of root tips of sesamum was similar to that of other chemicals like α -naphthalene and β -naphthoxyacetic acid. Just like other growth promoting substances PAA also stimulates the cell enlargement and root growth at 0.00001% level as compared to that of control. At 0.0001% concentration there is considerable disturbance in mitosis and at 0.001% level, there is complete inhibition of cell division. Thus the roots of *Sesamum* are highly susceptible to the action of PAA in aqueous medium.

(II) EFFECT OF CHEMICALS ON GERMINATION AND GROWTH:—

In order to study the effect of the three chemicals α -NAA and β -NAA and PAA, on the germination of seeds and their growth, they were soaked in three concentrations for 24 hrs, washed with water and kept in moist filter paper in petri dishes and observations made at required intervals. In general it has been observed that sprouting of seeds does not take place if the seeds are treated at 0.001% and a delayed sprouting of seeds at 0.0001%. At concentration of 0.00001% and less, sprouting is initiated even after 12 hrs. of soaking irrespective of the length of treatment and is found to be more significant than over the controls. This effect has been observed only in α -NAA and β -NAA and to a less extent in PAA. It has been found that germination and growth inhibitions are nearly always associated with one another. When seeds in different stages of germination are transferred from water to chemicals, their growth is inhibited. In a very advanced stage they continue to sprout but the radicles degenerate. Generally the roots are much more sensitive than the coleoptile, plumule or young sprouts to the effect of inhibition.

At higher concentrations elongations of the roots cease after a length of about 4-8 mm has been attained. In some cases the

root hair production is also stimulated. But it appears that although meristematic activity is inhibited by the above chemicals, differentiation as shown by root hair formation is unaffected and continues to the root apex. It is noticed that high concentrations cause some swelling of the roots so that the tip of a root which has stopped growing does not retain the dimensions of a normally growing tip, but increases to a thickness which equals or slightly exceeds that of fully differentiated roots of control plants. The hypocotyl swells considerably as seen in colchicine and may even reach thickness 3 to 4 times that of control seedlings. Similar effects have been observed when the seeds were sown in soil in petri dishes moistened with the chemicals.

The present study demonstrates that the effect of the various chemicals is not the same on the different varieties of the same species. The varieties which differ in the colour of the seed coats react differently towards the same chemicals. Kostoff (1938) found that *Vicia*, *Lathyrus* and *Medicago* species were less susceptible to the action of acenaphthene than were oats, barley and other graminaceous species. Levan & Ostergren (1943) also noted that leguminous plants were more resistant to naphthalene derivatives than some grasses. In *Sesamum* it has been observed that the brown seeded variety is highly resistant to the action of chemicals, while the white seeded ones are highly susceptible to this effect. Hitchcock & Zimmerman (1940) has pointed out from the responses towards rooting of different plants, that the relative effects of chemicals vary considerably according to genera and species. The reason for this differential effect is of considerable value but the principles underlying this differential resistance are yet unknown.

Discussion: It is quite clear that mitotic irregularities are induced by the chemicals acenaphthene, α -naphthalene acetic acid, β -naphthoxy acetic acid, and phenyl acetic acid. Such mitotic aberrations appear to be closely similar to those reported in the literature due to colchicine and to a range of phenolic and amino compounds. Recent researches on mitotic poisons have demonstrated that two periods of the cellular cycle are outstandingly sensitive to chemical interference – the metaphase or more exactly the formation of a normal anisotropic spindle, and a certain period preceding prophase. The poisoning of the later stage corresponding probably to the increase in the thymonucleic acid content of the chromosomes, leads to nuclear destruction by 'pycnosis'. But there are deviations in effect and in most of the cases in the present

study no tetraploid was observed. The effects characteristic of colchicine which includes interference with centromere division, giving rise to typical paired chromosomes, and spindle suppression causing polyploidy were observed. The multipolar spindles, resulting as interphase nuclei of irregular shape and multinucleate cells seen are believed to be due to partial suppression of spindle action. Under the higher dosage of concentration complete suppression of cell division and in some cases over contraction of chromosomes were observed. Doxey (1949) in onion and rye and showed that morphological effects of the isopropyl phenyl carbamate treatment closely resemble those caused by colchicine and acenaphthene and other known mitotic poisons but were induced by a much lower concentration. Doxey & Rhodes (1949) showed the similarity of effects of acetic acid and of 4-chloro-2-methylphenoxy to those of x-radiation and mustard gas.

Koller (1947) has suggested that mitotic abnormalities prevailing in tumours are due to shortage of food and to toxic break down products of the neoplastic tissues. The present study however shows that food supply to cells is not affected as the root structure is normal. The effects are more likely to be due to the toxic properties of the compound itself acting either on essential metabolic substrate or by chemical action on the enzymes essential for the processes. This mode of action would correspond with the direct chemical action as suggested by Lavan & Tjio (1948) as opposed to the theory of physical action put forward by Ostergren (1944). Dustin (1947) has considered the action of compounds affecting mitosis and suggests that carbamates interfere with purine metabolism and this would presumably affect the nucleic acid cycle of the cell. The enlarged nuclei and over contracted chromosomes seen in *Sesamum* root tips after treatment at 0.001% provides some evidence to the theory suggested by Dustin (1947). The evidence from the present study points out to the conclusion that interference with nucleic acid metabolism is primary or major cause of the mitotic irregularities.

All authors who have tried to elucidate the physiological action of different chemicals and extracts containing inhibitors have found that inhibition is accompanied by a stimulation of germination and growth. At sufficiently high dilutions, the inhibition of chemicals is replaced by stimulation. In the present study it has been noticed that at 0.001% concentration suppression of cell

division would be sufficient to prevent growth thereby promoting inhibition. At lower concentration 0.0001% rate of cell division is reduced and growth rate is also likely to be reduced. But the cell division may be prevented when polyploid tissues develop; cell enlargement continues though not in proportion to increase in chromosome number. Audus & Quastel (1948) observed that a concentration of 0.001%, sulphanilamide and sulphapyridine were more toxic to root growth than sulphaguanidine and sulphathiazole at the same concentration. Doxie (1949) has noticed with isopropyl phenyl carbamate similar effects on onion and rye with higher concentrations as well as lower concentrations. At concentration of 0.00001% there is marked tendency for the seeds as well as root tips for their germination and growth respectively. This indicates that stimulation takes place at very low dilutions. This relation between inhibition and stimulation can be explained in one of the three ways: (1) The same substance inhibits in high and stimulates in low concentrations. This is in agreement with well known fact that hormones and poisons inhibit at high and stimulate at low levels. The action of different dilutions of these chemicals seem to confirm this supposition. (2) Inhibition and stimulation are caused by two different substances whose action varies with respect to the concentration of the chemicals. The action of the inhibitor is sensitive to varying concentrations of the chemicals, while the action of the stimulator does not alter with the changes in the concentration of the chemicals. (2) The inhibitor is transformed into a stimulator by a chemical change during germination.

SUMMARY.

Growing roots of *Sesamum orientale* L., were treated with acenaphthene, α -naphthalene acetic acid, β -naphthoxy acetic acid, and phenyl acetic acid at concentrations of 1000, 100 and 10 p.p.m. for 24 and 28 hrs. Root tips were fixed and squash preparations made. Effects described include interference with spindle mechanism formation of multipolar spindles and enlargement of nucleoli. The effects are compared with those of colchicine. The effects of these chemicals on germination and growth are discussed.

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Studies on Seed-Borne Fungi of Rice

by

C. V. GOVINDASWAMY, B. Sc. (Ag.), Assoc. I. A. R. I.
Crop and Plant Protection Officer (Mycology), Coimbatore

Introduction: The paddy crop is subjected to a number of diseases both in the seedbed and in the mainfield. Most of the trouble arises as a result of either using diseased seed material or the seed is attacked by the microflora present in the soil. The damage becomes very serious when soil and weather conditions favour the growth and development of the harmful microflora of the seed and soil. As a result of infection, there is seed decay resulting in the failure of germination of seed, destruction of young seedlings before emergence (pre-emergence blight) and even the seedlings that emerge out survive in a weakened state until they finally succumb to some trouble or other (post-emergence blight). The damage to seedlings is quite enormous resulting in the non-availability of sufficient seedlings and at times even necessitating the raising of seedlings again.

Object: The present study was undertaken at the Agricultural College, Bapatla, with the following objects in view: (1) to determine the commonly associated fungi of the paddy seed and (2) to study the effect of seed-borne fungi on the germination of seed and emergence of seedlings.

Materials and Methods: The seed material used in the investigation was obtained from ten rice research stations distributed all over the state (composite state of Madras and Andhra), each station representing an important rice growing belt. From each station seed samples of three popular varieties were obtained. The seedlings were raised in mud pots of the size 9"×9", using pulverized clay soil collected from paddy fields. The soil was well powdered, sieved and sterilized at thirty pounds pressure for two hours whenever sterilized soil was used. The sowings in all the experiments were done with seeds selected at random at the rate of 25 seeds per pot.

The epiphytic microflora of the seed samples was determined by the centrifugal method. The seeds from each variety were picked at random and transferred to a clean test tube. In each tube 10 c. c. of sterilized water were added, vigorously shaken for five minutes and the water extract transferred to centrifuge tubes.

The sterilized water extracts of the seed samples were centrifuged in a Clay Adam's centrifuge for ten minutes. After centrifuging, the supernatant liquid was decanted and the sediment examined under the microscope for the presence of fungal spores or other characteristic fruiting bodies of the fungal flora.

The determination of endophytic fungi was done by the use of agar plate method. Fifty seeds selected at random from each variety were surface sterilized with mercuric chloride (1:1000) for three minutes and washed with five changes of sterilized water. The seeds were spaced equidistantly in oats agar medium in Petri dishes and the plates were incubated at laboratory temperature (mentioned in the proper context). Throughout the investigation Petri dishes of ten centimeters only were used. The mycelium arising from the colonies around each seed, on the third or fourth day, was transferred to fresh agar slants. The cultures were further purified, if necessary, and the purified cultures were maintained in oats agar medium.

All the cultures, excepting *Piricularia* and *Sclerotium* used in the investigation, were isolated and purified in this laboratory from the seed samples obtained from different localities. The two cultures viz., *Piricularia* and *Sclerotium* were kindly supplied by the Government Mycologist, Coimbatore. The cultures when required for inoculation purposes, were multiplied on 50 c. c. of oats agar medium in 250 c. c. Erlenmeyer flasks for two weeks and then used as inoculum. A sterilized water suspension of the spores or sclerotia of the respective fungi were prepared and surface sterilized seed of MTU. 3 were treated with fungi for half an hour. After treatment, the seeds were dried on a clean drying sheet and then sown in pots containing sterilized soil.

Experimental: Seed-borne diseases are responsible for serious losses in almost every crop grown from seed. It is, therefore, important to test the seed before sowing regarding its freedom from diseases. The object of testing the seed is not only to determine the seed-borne infections but also to control them, if found in time, by some kind of seed treatment. It is also desirable to determine whether the infection is only superficial (epiphytic) or whether it penetrates more deeply into the seed (endophytic). In general the epiphytic infections occur more frequently than the endophytic ones and can be effectively controlled by seed treatment.

1. **Determination of epiphytic fungi by the centrifugal method:** The seed samples were examined for the presence of epiphytic fungi. For this purpose, ten seeds from each variety were picked at random and examined for the presence of prevalent fungi as per the method described in the forgoing page. The examination of thirty varieties of paddy constantly revealed the presence of the spores of the fungi mentioned in table 1. (Vide Appendix)

It will be seen from the data presented in table 1 that *Helminthosporium* was predominating in most of the varieties and it was followed by *Fusarium*. The prevalence of other fungi viz., *Curvularia*, *Alternaria*, *Nigrospora* and different groups of moulds viz., *Aspergillus*, *Penicillium* and *Rhizopus* were of equal intensity and noticed only on few varieties. Stray spores of *Piricularia* were observed only on two strains of paddy viz., ADT. 3 from Aduthurai and BCP. 2 from Buchireddipalem.

2. **Determination of endophytic fungal flora by agar plate method.** The different seed samples were examined for the prevalence of endophytic fungi by agar plate method. The seed material from each variety was divided into three separate lots, each consisting of fifty seeds selected at random. The first lot was surface sterilized with mercuric chloride (1:1000) and then incubated in oats agar medium. The second lot was treated with an organomercury fungicide viz., Agrosan GN and after removing the excess fungicide on the seed coat, the seeds were incubated in the agar medium. The third lot was directly incubated in the agar medium without any treatment to serve as control. The plating was done with seeds spaced at equidistant intervals under aseptic conditions. The plates were incubated at the laboratory temperature (25°C–30°C). On the third or fourth day the mycelium arising from the colonies around the seeds was transferred to fresh agar slants. The growth of the fungus in the slants was observed and examined under a microscope to make sure of its freedom from contamination. In all cases, the purity of the cultures was ascertained before proceeding to their identification. The cultures were identified mainly by observing their spores and other characteristic fructifications. No efforts were made to identify the species of the organisms. More than hundred isolations were made and the most prevalent genera of fungi frequently isolated from thirty different varieties are presented in table 2. (Vide Appendix).

The data presented in table 2 reveal that in the case of unsterilized seed (control) there was a preponderance of *Rhizopus* sp. in all the varieties. The prevalence of different groups of moulds viz., *Aspergillus*, *Penicillium* and bacteria was observed in low intensities only on few varieties. In the case of seed sterilized with mercuric chloride, the preponderance of *Curvularia* sp. over other fungi was very striking in all the varieties examined. The prevalence of *Helminthosporium* sp. was less than *Curvularia* sp. although its occurrence was more frequent than the rest of the fungi. Among the other fungi isolated **Chaetomium* and moulds particularly species of *Aspergillus*, were significant while *Fusarium* and **Sphaeropsis* were encountered less frequently. In the case of seed treated with Agrosan GN there was complete absence of fungi but bacteria were observed on few varieties.

3. **Effect of associated seed-borne fungi on germination of seed and emergence of seedlings:** The presence of micro-organisms either on the seed coat or inside affects the seed in several ways. The discolouration of rice grains on account of the presence of fungi on the seed coat is a very common phenomenon known to everyone familiar with growing of rice. The seedling blights and seed rots have been reported by many investigators as a result of using diseased seed material. With a view to studying the effect of different seed-borne fungi isolated from various samples, on the germination of seed and emergence of seedlings an experiment was conducted. The isolates of *Curvularia*, *Helminthosporium*, *Fusarium*, *Chaetomium*, *Sphaeropsis*, *Piricularia* and *Sclerotium* were selected for the experiment. The last mentioned fungus was included for the trial because of its frequent association with seed in the soil. The seed of a medium duration variety viz., MTU. 3 was surface sterilized with mercuric chloride (1:1000) and then divided into eight different lots. The seeds of seven lots were treated with spores or sclerotial suspension of the seven fungi mentioned above, for half an hour. The treated seeds were air dried and sown in pots containing sterilized soil. The eighth lot was also sown, without any treatment of fungus, for the purpose of control. The sowings were done in duplicate at the rate of 25 seeds per pot. The experiment was conducted during the regular paddy season and conditions were ideal for the normal germination of seed and development of seedlings.

*Kindly identified by the Government Mycologist, Coimbatore.

The observations were recorded on the germination of seed, emergence and vigour of seedlings. The germination of seed on the fourth day of sowing was taken as the basis for determining the percentage of emergence was obtained by recording the number of seedlings that have emerged completely and growing vigorously on the tenth day of sowing and the total number of seeds germinated in each pot. The results are presented in table 3.

TABLE 3.
Effect of seed-borne fungi on the germination of seed and emergence of seedlings.

No.	Name of fungus	Percentage of germination	Percentage of emergence	*Remarks
1.	<i>Chaetomium</i>	.. 52	100	
2.	<i>Curvularia</i>	.. 54	100	
3.	<i>Helminthosporium</i>	.. 42	80	
4.	<i>Fusarium</i>	.. 42	68	
5.	<i>Piricularia</i>	.. 50	88	
6.	<i>Sclerotium</i>	.. 60	84	
7.	<i>Sphaeropsis</i>	.. 58	80	
8.	Control (Untreated)	.. 88	100	

*The results obtained from both the pots were identical and the percentages given above represent the average of two pots.

It will be seen from the above data that the percentage of germination was affected in varying degrees by different fungi. The two parasitic fungi viz., *Fusarium* and *Helminthosporium* have caused failure of germination of seed to a marked extent while there was only slight reduction in germination percentage with *Piricularia*, *Chaetomium*, and *Curvularia*. The effect of *Sclerotium* and *Sphaeropsis* on germination was negligible in comparison with other fungi. The results also indicated that the emergence of seedlings was appreciably affected only by *Fusarium* while other fungi viz., *Helminthosporium*, *Sphaeropsis*, *Piricularia* and *Sclerotium* have affected the emergence only to a small degree. The normal emergence was not affected by *Curvularia* and *Chaetomium*. It was further observed that only those seed-borne fungi that are known to cause serious diseases on paddy like *Fusarium* and *Helminthosporium*, are capable of causing damage to seed and young seedlings while the saprophytic seed-borne fungi are not likely to cause any damage, under optimum conditions for the normal germination of seed and the growth of seedlings.

Discussion: Several investigators have reported that the fungi associated with seeds are responsible for bringing about reduced emergence and seed decay. Many fungi have been reported to cause pre-emergence seedling blights. These troubles are further aggravated when the weather and soil conditions favour the growth and development of seed and soil-borne fungi. A number of fungi are able to attack the grains, and Padwick (1950) includes *Piricularia oryza*, *Cochliobolus miyabeanus*, *Trichoconis padwickii*, *Gibberella zeae*, *Neovossia horrida*, *Ustilagoidea virens* and *Nigrospora* spp. in that list. He has also listed some of the fungi that have been more frequently observed or isolated from the grains. Mundkur (1946) reported, after examining the diseased specimens of leaves and seeds collected from all over India, said to be affected by *Helminthosporium oryzae* (*C. miyabeanus*), that there was a preponderance of *Curvularia* spp. He also concluded that in all probability, the *Curvularia* spp. are responsible for losses similar to those caused by *H. oryzae*. In the present investigation the determination of epiphytic fungal flora by the centrifugal method has revealed the presence of many fungi viz., *Helminthosporium*, *Curvularia*, *Fusarium*, *Alternaria*, *Nigrospora*, *Piricularia* and several groups of moulds. But among these, there was a preponderance of *Helminthosporium* only over others and *Curvularia* was met with less frequently. The prevalence of other fungi was only of stray occurrence and observed only on some varieties.

The isolations of endophytic fungi by agar plate method yielded species of *Curvularia*, *Helminthosporium*, *Fusarium*, *Chaetomium*, *Sphaeropsis*, *Piricularia* and various moulds particularly species of *Aspergillus*. In this case there was a preponderance of *Curvularia* spp. over other fungi. *Helminthosporium* was also isolated readily from most of the varieties but less frequently than *Curvularia*. The other fungi were encountered in small degrees with few varieties only. It is evident from the results obtained that almost all varieties are infected with *Helminthosporium* and *Curvularia* to an appreciable extent and to a lesser degree with *Fusarium*. The other fungi isolated in the course of the investigation, excepting *Piricularia* which is mainly an air-borne parasite, are only saprophytes and are not known to cause any serious damage to paddy crop. Therefore a knowledge of the most commonly prevalent types of fungi on the seed material will be of immense help in devising the most economic and effective method of seed treatment.

The data regarding the effect of fungi isolated from seed material, on germination of seed and emergence of seedlings, revealed that *Fusarium* and *Helminthosporium* have markedly affected the germination of seed. The other fungi viz., *Chaetomium*, *Curvularia*, and *Piricularia* have affected the germination only to a small extent. The seedling emergence was affected to an appreciable degree only by *Fusarium* and to a little extent by *Helminthosporium*, *Piricularia*, *Sphaeropsis* and *Sclerotium*. The indications obtained with *Helminthosporium* and *Fusarium* in reducing the germination percentage and emergence of seedlings are in conformity with the results reported by other workers. Padwick (1950) stated that seeds infected with *H. oryzae* germinate poorly resulting in the wastage of some proportion of the seed. As a result of infection by *H. oryzae*, Ocfemia (1922) recorded a seedling mortality of 10 – 58 per cent in Philippines while Tucker (1927) recorded 15 per cent mortality and seedlings in Puerto Rico. Ito and Kimura (1931) reported from Japan that although accurate estimates of losses due to *Gibberella fujikuroi* (*Fusarium molini-forme*) are not known, they are frequently as high as 20 per cent or more, mainly in the seedbed but partly in the field. Thus the indications arrived at in this investigation emphasize the need for a critical examination of the seed material to ascertain the nature of the fungi present so that the most effective method of control can be devised.

Cralley and Tullis (1937) stated that rice seedling blight is a disease complex encountered in all rice growing tracts and the severity of seedling blight depends upon weather conditions and the microflora of the seed and the soil. They have further stated, that in Arkansas there was a tendency for the seedling blight to occur when the soil temperature was unfavourable for the rapid germination of the seed and maximum growth of seedlings. Tisdale (1922) stated that wet condition of the soil checked the normal growth of seedlings and favoured the development of the fungus resulting in the destruction of the seed. The results obtained in this investigation have indicated that only parasitic seed-borne organisms can cause damage to seed and young seedlings while the saprophytic seed-borne fungi are likely to be harmful only under conditions of temperature and soil moisture unfavourable for the normal germination of seed and development of seedlings. In the light of these findings, the evidence of sowing, at a time unfavourable for the germination of seed and development of seedlings,

eventhough the seed material is free from parasitic fungi, is a practical point of considerable importance to cultivators.

Summary: 1. The determination of epiphytic fungal flora by the centrifugal method, from thirty different varieties of paddy collected from all over the state, revealed constant association of the following fungi viz., *Helminthosporium*, *Curvularia*, *Fusarium*, *Alternaria*, *Nigrospora*, *Piricularia* and various groups of moulds.

2. The isolation of endophytic fungal flora by agar plate method repeatedly yield the following fungi viz., *Curvularia*, *Helminthosporium*, *Fusarium*, *Piricularia*, *Chaetomium*, *Sphaeropsis* and different groups of moulds particularly species of *Aspergillus*.

3. Among the several fungi isolated from different varieties, only two parasitic seed-borne fungi, *Helminthosporium* and *Fusarium* are found to cause adverse effects on germination of seed and emergence of seedlings.

4. The saprophytic seed-borne fungi viz., *Curvularia*, *Chaetomium* and *Sphaeropsis* are not likely to cause serious damage under optimum conditions for the normal germination of seed and the growth of seedlings.

Acknowledgement: The investigation was carried out at the Agricultural College, Bapatla, during 1953-54 as part of the research items of Mycology Section. I wish to express my sincere thanks to Sri T. S. Ramakrishnan, M. A., F. A. Sc., the then Government Mycologist, Coimbatore, for his helpful suggestions and critically going through the manuscript,

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TABLE I. Showing different genera of epiphytic fungi associated with seed.

No.	Station	Name of variety	Genera of Fungi					Seed Sterilized with 0.1% Hg I ₂										Seed treated with Agrosan GN		
			Helmintho-sporium	Curvularia	Fusarium	Alternaria	Nigrospora	Piricularia	Moulds	Rhizopus	Moulds	Bacteria	Curvularia	Helmintho-sporium	Piricularia	Chaetomium	Sphaeropsis		Fusarium	Moulds
1	Aduthurai	ADT 3	+				++	+	++	+	+	++	+	+						
2	"	" 20	+			+			++	+	+	++	+	+			+			R
3	"	" 22	+			+			++	+	+	+	+							R
4	Ambasamudram	ASD 1	+						++	+	+	+	+	+						
5	"	" 5	+		++				++	+	+	+	+	+			+			
6	"	" 6	+		+				++	+	+	+	+	+			+			A
7	Anakapalle	AKP 2	++	+					++	+	+	++	++	++				+	+	A
8	"	" 4	+			+			++	+	+	++	++	++				+	+	P
9	"	" 11	+						++	+	+	++	++	+				+	+	P
10	Bapatla	MTU 7						+	++	+	+	++	++	++				+	+	R
11	"	" 12							++	+	+	++	++	++	++	++				R
12	"	" 19		+					++	+	+	++	++	++	++	++				
13	Buchireddipalem	BCP 1	+			+			++	+	+	++	++	++	++	++				

Seed-Borne Fungi of Rice

14	BCP 2	+	++	+						++	+	+	++	+							
15	" 3	+	++							++						+					
16	Mangalore Halluga		+							++									+	A	
17	Kayama	+								++	+	+	++	+	+	+			+	P	
18	Muscathy				+					+	+	+	+	+	+	+			+	R	
19	Maruturu MTU 1	+								++				+					+	P	
20	" 3	+								++				+							
21	" 5	+								+				+							
22	Pattambi PTB 2	+		+						++	+	+	++	+	+	+			+	A	
23	" 7									++											
24	" 10	+								++	+	+	++	+	+	+					
25	Samalkota SLO 2	+					+			++				+						+	R
26	" 13	+					+			++				+						+	A
27	" 15	+					+			++				+						+	A
28	Tirurkuppam TKM 3	+								++	+	+	++	++	++				+	A	
29	ADT 22	+			+		+			++	+	+	++	++	++						
30	CO 19	+	+	+						++	+	+	++	++	++	++					

Note: + = Presence of stray spores.
 ++ = Presence of few spores.
 +++ = Presence of large number of spores.

Note: + = Isolated from less than 5% of the seeds.
 ++ = Isolated from less than 40% of the seeds.
 +++ = Isolated from more than 80% of the seeds.

A = Aspergillus.
 P = Penicillium.
 R = Rhizopus.

Research Notes

A Short Note on the Influence of Season and Soil on the Life Period of Cane

These studies were started in 1949 and continued for a season with the object of determining the best time for planting and harvest to obtain good quality of cane with a high yielding variety, namely, Co. 419. The experiments were conducted by the Superintendent, Liaison Farm, Kulitalai in collaboration with the Government Agricultural Chemist.

Planting was done at intervals of a month. The canes were harvested in the following year and yield data were recorded

In the matter of yield (Table I) canes planted in August recorded significantly better yields namely 44.2 tons while those planted in September gave only 32.04 tons. There was difference due to the variation in the period of harvest.

The juice was analysed periodically for sucrose and purity (Table II). From the data it will be seen that there is no marked difference due to treatments in the quality of juice.

TABLE I
Summary of results - Major Treatments

Time of planting	Yield of cane per acre		As % on control	No. of canes harvested per acre	C. C. S. in tons per acre
	In tons	In maunds			
August	44.82	1219	100	28,434	4.61
September	32.04	871.4	71.49	26,895	3.37
"Z" test is satisfied.					
S. E. of treatment mean		0.64 tons	17.31 maunds		
Critical difference		P = 0.65 1.64 tons	44.64 maunds		

Conclusion: August September.

N. B.: C. C. S. means Commercial Cane Sugar.

TABLE II
Periodical juice analysis - time of planting and harvest trial
Kulitalai - August planting

Time of Planting	Time of harvest	May %		June %		July %		August %	
		Suc-rose	Puri-ty	Suc-rose	Puri-ty	Suc-rose	Puri-ty	Suc-rose	Puri-ty
August	July	12.88	79.16	14.87	81.43	15.83	82.49	15.30	75.67
	August	12.73	78.68	14.41	82.72	16.49	86.97	15.57	78.60
September	September	14.46	82.25	14.87	82.89	16.44	85.80	15.89	76.62
	July	12.61	78.06	13.99	80.44	11.43	62.53	15.36	80.25
	August	12.12	77.79	14.63	82.58	16.27	87.51	15.24	83.19
	September	11.01	74.39	14.98	87.01	15.59	84.36	15.99	78.34

Lawley Road P. O.,
Coimbatore.

GOVT. AGRICULTURAL CHEMIST.

Letters to the Editor

Threshing of Paddy with Tractor

Excepting a few, almost all the ryots may wonder when they are informed that paddy sheaves can be very economically threshed after the first hand-threshing by means of rubber tyred tractor. This was largely demonstrated in the farm of Sri S Ramalingasamy, M. A., B. L., at Papanad, Tanjore District.

The sheaves of the produce of half an acre were spread round to a radius of 14 feet leaving an empty space at the centre to a diameter of 8 feet.

The tractor used was a W. 6. McCormick Deering which was run over the sheaves in the fourth gear at a speed of 5½ miles per hour. The action of the tractor wheels in motion seems to be that the two front wheels by their quick turning action agitate the sheaves in front while the two rear wheels push the sheaves slightly behind due to their centrifugal force and at the same time rub the sheaves against the ground due to which action the grains shed down from the ears. The tractor took only ten minutes for the threshing operation during which the entire grains and chaff too had got separated from the ears.

It has been observed that working the tractor at the fourth gear at a speed of 5½ miles per hour, gives good results, since the stirring and rubbing action by the wheel movement would be much better at this speed than when the tractor moves at less speed.

The shedding of the grains was cent percent even when the sheaves had been spread to a thickness of 9 inches. The only necessary factor for achieving this good result is to take up the sheaves twice during the tractor operation by one or two men with the aid of a two pronged stick.

Ten minutes are required before and after the tractor threshing for spreading the sheaves and removing them respectively. Thus only half an hour was required for completing the entire operation, right from spreading the sheaves to the collection of grains from the floor. Since more time is required for sweeping the grains from the floor if two floors can be had side by side, the threshing operation can go on uninterrupted without wastage of time as the tractor can thresh in the second floor while, the first one is being swept and cleaned. The produce of one acre can be threshed in an hour and in a day of 8 hours eight acre produce can be easily handled. When there are two threshing floors produce of 16 acres can be handled in a day of 8 hours. This turnover can be even doubled if the tractor is worked in the night with its lights on. This would mean really a boon to Tanjore mirasdars, who often

find it very difficult to complete the second threshing operation of Kuruvai paddy with cattle as either rains interfere during October - November or the Thaladi ploughing collides with the threshing work. Kuruvai straw cannot be stacked for a long time unlike the Samba varieties, as it gets spoiled in the rains, and hence it is necessary to thresh the sheaves soon after the hand threshing, which can be achieved only by the tractor.

In the case of cattle threshing the sheaves are spread at intervals, one pile over the other as the cattle go round and round. Therefore, the final collection of straw also is done in stages and there is always the chance of throwing away some of the grains along with the straw as the shed grains are embedded between layers of straw without all of them going to the bottom as in the case of Tractor threshing, for which the entire sheaves are spread once only at the beginning and all the grains are forced to the very bottom.

The following is the comparative statement showing the time taken, percentage of shedding of grains and chaff and cost of threshing.

	Tractor Threshing		Cattle	Remarks
	Single threshing floor	Double threshing floor	Threshing	
1. Quantity threshed in a day of 8 hours	Produce of 8 acres	Produce of 16 acres	Produce of 4 acres	Variety of paddy used was Adt. 20
2. Percentage of shedding of grains	100%	100%	95%	
3. Percentage of shedding of chaff	99%	99%	75%	
4. Cost of threshing one acre produce	Rs. 2-4-0	Rs. 1-2-0	Rs. 1-8-0	

From this comparative statement it would be clear that the cost of threshing by Tractor on double threshing floor is the cheapest and the time taken by Tractor is only one fourth of what is taken by cattle. This saving in time is a very great factor in Tanjore district where the number of sunny days during the Kuruvai harvest season is few and the cattle labour is also scarce. And the private tractor owners find more work for their machines whose idle period too is reduced to the minimum.

Tanjore.

T. P. SHANMUGANAINAR,
Agricultural Engineering Supervisor.

Maturity of Potato Seed Tubers : Its effect on yield

The potato crop is ready for lifting when the haulms completely dry up and die down, indicating full maturity. At this stage the jacket adheres firmly to the flesh of the tubers and peeling of the skin in minimum during harvest. But in western countries, if the standing seed crop exhibit any considerable virus infection, the tubers are lifted before they are fully mature, to prevent the disease from being conveyed to the future progeny by descension through the haulms at maturity.

In their studies made at Wye, Rothamsted and Harper Adams College and using certified seed obtained from Scotland, Blackman and Brown * (1) concluded that there was very little to choose between the crops raised from mature and immature seed. While immature seeds from virus-infected stock showed comparatively less infection in the progeny, any other special merit due to the immaturity of the seed itself was not evident. Very little reliable evidence is available on this point from the results of recent workers, though Brandreth and Dallas * (2), after studies on yields resulting from different lengths of the growing seasons with three varieties, viz, Egicure, Ninetyfold and Arran Pilot, concluded that lifting early varieties before they were mature gave markedly lower yields.

Details of trials at the Agricultural Research Station, Nanjanad :
During the four-year period, 1948-'51, trials were conducted to find out if any improvement in yield could be obtained by the use of immature seed. Great Scot, the popular, commercial variety of the Nilgiris, which comes to maturity in 105 days after planting, was used. A duration of 75 days, when the leaves and the haulms begin to first change from green to yellow, was fixed as the stage for the lifting of the immature tubers for use as seed.

The trials, laid out under A B B A design with 12 replications, were run for a total period of ten seasons and the yield values obtained are recorded below :—

SUMMARY OF RESULTS						
Season	Mean acre yield in lb from		Standard Error	'Z' test satisfied or not	C D. (P=0.05)	
	A (Mature seed)	B (Immature seed)				
1948						
1. Main crop	..	15917	167'8	592	No	..
2. Second crop	..	12792	10995	344	..	..
1949						
3. Main crop	..	9181	6806	400	Yes	960
4. Second crop	..	6350 ¹	5533	400	No	..

* (1)-(2) See page 70.

Season	Mean acre yield in lb. from		Standard Error	'Z' test satisfied or not	C D. ($P=0.05$)
	A (Mature seed)	B (Immature seed)			
1950					
5. Irrigated crop ..	1850	1900	180	"	..
6. Main crop ..	14500	14666	280	"	..
7. Second crop ..	6233	7333	360	Yes	792
1951					
8. Irrigated crop ..	3100	8566	838	"	1956
9. Main crop ..	7933	7366	134	No.	..
10. Second crop ..	7334	5334	960	"	..
Conclusion: Main crop, 1949 .. A, B					
Second crop, 1950 .. B, A					
Irrigated crop, 1951 .. B, A					

There were no significant yield differences between the two treatments for seven out of the ten seasons. For the remaining three seasons, mature seed was found superior for one season only and immature seed for two seasons.

The results revealed that there was no special or inherent benefit of lifting an immature crop for use as seed. On the other hand, tubers lifted before full maturity always undergo a lot of skinning while lifting and this results in a decline of their market value and keeping quality. Hence, under the Nilgiri conditions, it is concluded that early lifting of the crop before maturity is not useful.

Acknowledgement: The above experimental data were compiled from the Madras Agricultural Station Reports (1948-'49 to 1951-'52) and from the results of the work of the staff during that period. This is gratefully acknowledged.

Agricultural Research Station,
Naujanad

M. D. AZARIAH,
K. SAPTHARISHI.

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CLEANINGS

Chemistry of Baldness: Primary of immediate causes of human baldness obviously include poor nutrition of the hair root and adjoining portion of the follicle where keratinisation takes place, according to Amos E. Light of Wellcome Research Laboratories. Speaking before the scientific section of the Toilet Goods Association he declared that poor nutrition could result from a lowered blood supply to that region, thus limiting the supply of amino acids and various enzymes needed for proper hair development. Secondary and systemic conditions possibly affecting hair growth include such factors as blood pressure, vessel wall tension, and diameter of the blood vessels, says Light. Also of possible effect are the estrogenic, thyroid, adrenocortical, and pressor hormones. Other possible factors causing hair changes are age, exposure of the scalp to the elements, mechanical, bacterial, and chemical irritation, muscular activity of the scalp, and diet including the intake of fats, vitamins, minerals, and calories. An upset sex hormone balance can affect hair growth. Methyl testosterone appears to increase connective tissue development at the expense of the vascular supply to the vicinity of the hair roots. A pressor agent such as serotonin liberated during lengthy periods of mental or even physical stress could contract portions of the capillary bed of the scalp. The male hormones could enable enough extra connective tissue to be formed to interfere permanently with the blood supply. Research for the future should include a study of various ways to predict oncoming baldness, Light says. Co-operation with insurance companies and medical clinics might enable various physical and physiological conditions to be associated statistically with baldness. Preventative measures causing dilation of the scalp capillaries and increased blood flow should be evaluated. This should include the study of mechanisms for introducing desired chemicals into the scalp, such as by hypodermic techniques and by ointment bases. One recent report says that an orally administered vasodilator related to nicotinic acid has caused some growth.

(Chem. and Eng. News, 32, 5038, 1954).

[A. M. K.]

Urine is a Good Manure: Practical way of using it in Villages: The country can produce over 15 million tons of extra grain, if all human urine is utilised for manuring crops, according to agricultural scientists. Human urine is a very rich source of nitrogen, but no attempts are being made by farmers to conserve it for the crops.

Special designs of urinals are being recommended to farmers to serve the dual purpose of sanitation and conservation of the urine as manure,

The idea in the design of one of the commonly recommended urinals is below-surface soaking of urine in a variety of materials. Commonly available absorbing material like soil, sand, ash, charcoal dust, sawdust, dry leaves, paddy husk, spent tea leaves, chopped straw, dry dung and waste paper are used. Bad smell is reduced to the minimum.

A drum type urinal can be easily put up. The drum is filled with any of these materials. The voided urine is conveyed from the mouth of the urinal through a tube buried six to nine inches deep inside the drum. When the entire material is thoroughly saturated with urine, it is removed and spread out in a thin layer to dry in the sun. Or better, dumped in a pit and covered with loose earth. The drum filled again with fresh material.

[ICAR Farm News Release No. 13]

Better returns with Green Manures: Simple Rule to follow: Farmers have come to realize the value of ploughing in a green manure crop before a grain crop is raised, and the practice is gaining popularity everywhere.

Yet, the full benefits of green manuring cannot be had unless farmers follow three simple rules in the application of green manures, crop scientists point out.

The green manure crop should be used at a stage when it is still succulent and not yet turned fibrous. Secondly, a period of six to eight weeks should elapse between the ploughing in of the green matter and the sowing of the next crop. The other equally important rule to be followed is to see that enough moisture is in the soil to allow the green matter to decompose and the next crop germinate. If too little rain is received, the field will have to be given irrigations to satisfy this condition.

[ICAR Farm News Release No. 15]

Treating Lesions: More Rapid Cure for Foot and Mouth: A rapid cure can be effected in cattle suffering from Foot and Mouth disease, if the lesions in the mouth and the feet are treated with antiseptics.

Foot and Mouth is one of the most common diseases affecting cattle in the country, and spreads very fast.

The common antiseptics recommended for treating lesions in the mouth are potassium permanganate solution in the proportion of 1:1000 or three per cent alum solution and for the lesions in the feet a mixture of coal tar and copper sulphate.

Infected premises should also be thoroughly cleaned and disinfected with 1.2 per cent caustic soda or 4 per cent washing soda, and as far as possible, all contaminated material should be burnt.

[ICAR Farm News Release No. 17]

Dehorning of calves: There are three ways of dehorning calves, namely, chemical, caustery or hot iron and mechanical.

(1) **Chemical dehorning with (a) Caustic sticks:** Calves up to two weeks can be treated with caustic soda or caustic potash. The latter is preferred as the former is likely to injure the surrounding tissues. An area the size of two rupee coins should be clipped over each 'button' a ring of vaseline about one inch wide is next smeared around the clipped area to check the caustic from running into the calf's eyes. The caustic stick is then moistened and rubbed over the button with a gentle rotary motion and the rubbing continued until blood just starts to seep through the smeared spot. The caustic should be applied to the area of the skin covering the horn bud. The caustic is injurious to skin and clothes. The user should either wear rubber gloves or use a paper wrapping for safe handling.

Afterwards, the calf should be tied up for at least six hours in a place where it cannot get wet. This will prevent scratching and rubbing of the treated area, which is likely to cause burning in other places and blindness if the caustic gains access to the eyes.

(b) **Antimony Trichloride:** Antimony Trichloride in a solution of flexible collodion has been found to be a very satisfactory dehorning agent.

The solution can be made up by any chemist from the following formula:-

Antimony Trichloride 28% Salicylic acid 7% and Flexible collodion 65%. The material is easy to apply and dries quickly and there is no danger to the eyes.

The hair around the buttons is clipped, the 'button' cleansed with methylated spirit and the solution is applied using a brush. The animal need not be tied up. The solution gives best results, if applied in the first nine days of life. After this period, it can be used fairly successfully if the top of the buttons is cut off with a pair of sharp curved scissors.

Caustery of Hot iron method: An alternative method of dehorning young calves is by the application of a special scaring iron over the horn bud.

Mechanical Method: Calves up to three months old may be treated by taking out the centre of the horn bud by means of a special instrument or a sharp knife. This may be followed with advantage by the application of scaring iron.

Queensland Agricultural Journal Vol. 79, p. 236, 1954.

[K. S. S. and A. M. K.].

Record yield of Ragi in an Alkaline Field at Agricultural Research Station, Palur: Field number 53 in garden land area at Agricultural Research Station, Palur is highly alkaline and it was found that no garden land crop was coming up well in the field. The crops which were sown or planted in that field were very stunted in growth and they developed patches where the plants died and the yields recorded were very poor. During the last two seasons daincha-crop was raised and the whole green matter was incorporated in situ by turning it in with a victory plough. A crop of Co 5 ragi was raised during the May to September season in 1954-55 and it has given a record yield of 2044 lb. grain per acre thus proving the suitability of ragi to alkaline soils and also the role played by daincha in reclaiming alkaline land.

[D. A's. News Letter for March 1955]

Cropping Rice Fallows with Early Cottons: The need for stepping up the production of cotton without affecting the area under food crops cannot be over-emphasised. Of the various avenues explored to achieve this subject, the utilisation of rice fallows for cultivation of cotton ranks foremost.

In Madras State, bulk of the paddy area remains fallow from the month of January till the onset of South West monsoon. During paddy season, the fields are practically flooded and especially in Tanjore Delta, due to high water table, there is storage of underground water which could easily be tapped by inexpensive methods. Thus the fallow period from January to June-July could be fitted in with a suitable variety of cotton which will produce 3 to 1 bale of long staple cotton per acre.

The problem of raising a short duration and quality cotton in the fallow period has been successfully solved by the recent introduction of P. 216. F, an early Punjab American variety which comes up in 4½ months and possesses a staple length of nearly one inch and found capable of spinning upto 40's H. S. W. G.

Soon after the harvest of paddy, sowing of cotton in paddy stubbles can be taken up immediately without waiting for preparation of the land. Four or five seeds are dibbled per hole and 25 lb. of seeds are required for sowing one acre. It has been found from experiments that closer spacing of 1½ ft. between rows and 4½" between plants in the row gives 35-40% increased yield over the usual wider spacing of 2½' x 9" adopted for cotton.

The seeds may be treated with cow dung and red earth paste for facilitating easy dropping of seeds and quicker germination. It will be highly desirable if seeds are treated with Agrosan GN (1 gram per 15 lb. of seeds) which will ward off seed borne diseases. In areas irrigated by tanks and wells, the fields may be well prepared after harvest of paddy, ridges formed and sowing done.

The germination is complete in about a week and when the plants attain a height of about 6", the paddy stubbles may be removed, plants earthed up and manuring done with 100 lb. Ammonium sulphate per acre. A second dose of 100 lb. Ammonium Sulphate per acre may be applied during flowering time. Manuring with Ammonium Sulphate contributes to increase the yields considerably. Irrigations should invariably be given after application of fertilizers. Regular irrigations depend upon the rainfall and weather conditions. Inter-cultivation like weeding and hoeing helps to keep off weeds and also facilitates an unhampered growth of the cotton crop.

Incidence of pests like jassids and leaf rollers can be effectively controlled by dusting cotton dust.

Variety P. 216. F. which appears to be cosmopolitan, yields upto 1000 to 1200 lbs. per acre under normal conditions, thereby giving the ryot an additional income of Rs. 200/- per acre. With the extension of cultivation of cotton to nearly 8 lakh acres of rice fallows in Tanjore delta alone, the production of cotton for spinning 40 counts in this State can be increased by about 4 lakh of bales which will go a long way to increase the production of quality cotton in this State.

[D. A's. News Letter for March 1955]

Sun as Sterilizer: Easy Treatment of Seed against Disease: The sterilizing effect of the sun can be made use of for keeping the smut disease of wheat in check. The disease is found wherever wheat is grown and causes heavy loss of grain. In the sun treatment the infested wheat grain is immersed in water at ordinary room temperature for four hours. Infested wheat comes from field in which black heads have appeared. The seed thus soaked is spread out for drying in the sun. The grain is thoroughly dried and stored till required for sowing. The practice gives excellent results wherever the temperature of the sun is high. Where it is low, the seed after soaking in water should be spread on a concrete surface, which is hot enough to kill the fungus causing the disease. This treatment of seed is successfully applied to control loose smut in barley and grain smut of jowar with good results at the Indian Agricultural Research Institute, New Delhi.

[I.C.A.R. Farm News Release No. 19]

Checking White Ant Attack: Method of using Repellant with Irrigation: Farmers having white ant trouble in their field will get good relief if they use Crude oil emulsion with irrigation water. Crude oil emulsion is used in the form of a solution in the proportion of one pound of the emulsion in four gallons of water. This can be used for irrigating the infested plants, also the semi-solid emulsion can be placed in the irrigation water by putting the soil in a gunny cloth and placing it in the flowing current. Since the repulsive smell of the emulsion lasts only for a few days, the operation has to be repeated after eight to ten days. Instead of crude oil emulsion, five per cent kerosene emulsion may also be used. Clean cultivation, removing the stubbles away from the field after harvest, deeper ploughing and following crop rotations are other methods suggested that help in removing the white ant trouble.

[I.C.A.R. Farm News Release No. 20]

CROP AND TRADE REPORTS

Crop Forecast - Paddy 1954 - '55 - First Report - Madras State: The area sown with paddy upto 30th September 1954 in the Madras State is estimated at 2,893,000 acres. Compared with the corresponding estimate of 2,825,000 acres, this is an increase of 2.4 per cent. The area estimated in the current year is the same as that for the last year in the districts of Salem and the Nilgiris. An increase in area is estimated in all the other districts of the State. The first crop of paddy has been or is being harvested on an extensive area in the districts of Tiruchirappalli, Tanjore, Tirunelveli and Malabar. The out-turn of these harvests is reported to be fair. In the other districts except the Nilgiris, harvests on a restricted area were reported and out-turn reported as generally fair. The condition of the standing crops in general is reported to be fair. More rains are reported to be needed particularly in the districts of Chingleput, South Arcot, North Arcot, Salem and Coimbatore to augment the water supply in irrigation sources and to sustain the standing crops.

The wholesale prices of rice, Second sort, per standard maund of 92 2/7 lb. (equivalent to 3,000 tolas, as reported from some important market centres on 8-10-1954 was Rs. 14-14-0 at Kumbakonam, Rs. 15-9-0 at Cuddalore, Rs. 16-1-0 at Madurai, Rs. 16-12-0 at Tuticorin, Rs. 17-0-0 at Tanjore, Rs. 17-5-0 at Erode, Rs. 17-13- at Salem, Rs. 18-2-0 at Mangalore and Rs. 20-4-0 at Kozhikode. Compared with the prices prevailing during the corresponding period of the previous year, the present prices reveal a fall of 40.8 per cent at Madurai, 34.0 per cent at Mangalore, 33.4 per cent at Cuddalore, 33.3 per cent at Tanjore, 21.7 per cent at Tuticorin, 16.5 per cent at Salem and 14.5 per cent in Erode. The price at Kumbakonam and Kozhikode have remained stationary.

Cholam Crop - 1954 - '55 - First Forecast Report: The area sown with Cholam (Jowar or Sorghum Vulgare) upto 25th September 1954 is estimated at 751,300 acres. Compared with the area of 747,200 acres estimated for the corresponding period of the previous year, this is an increase of 0.5 per cent. The increase is due generally to favourable seasonal condition in the year under review. Cholam is not grown in the districts of South Kanara and the Nilgiris. The area estimated is the same as that for last year in the districts of Chingleput and Malabar. A decrease in area is estimated in the districts of Salem and Tiruchirappalli and an increase in the other district of the state. The condition of the standing crop is reported to be generally fair.

Cumbu (Bajra) - 1954 - '55 - First Forecast Report - Madras State: The area sown with Cumbu (Bajra or Pennisetum Typhoideum) upto 25th September 1954 is estimated at 709,000 acres. Compared with the area of 699,5000 acres estimated for the corresponding period of the previous year, this is an increase of 1.4 per cent. The increase is due to favourable season this year. Cumbu is not grown in the districts of Malabar, South Kanara and the Nilgiris. The area sown in Tanjore is estimated to be the same as that in the previous year. A decrease in area is estimated in the districts of North Arcot, Salem, Madurai and Tirunelveli and an increase in the other districts of the State. The early sown crop has been harvested in the districts of North Arcot and Salem and the yield obtained was reported to be below normal. The condition of the report is reported to be generally fair.

Ragi - 1954 - '55 - First Report - Madras State: The area sown with ragi (Eleusine Coracana) in the Madras State upto September 1954 is estimated at

5,75,400 acres. Compared with the area of 563,000 acres estimated for the corresponding period of the previous year, this is an increase of 2.2 per cent. The increase is due generally to favourable seasonal conditions. The estimated area is the same as that for last year in the districts of South Arcot and Malabar. A decrease in area is estimated in the districts of Madurai, Tirunelveli, South Kanara and the Nilgiris and an increase in the other districts of the State.

Cotton - Third Forecast Report 1954-'55 - Madras State: The area sown with cotton upto 25th November, 1954 is estimated at 612,500 acres. Compared with the area of 592,900 acres estimated for the corresponding period of the previous year, this is an increase of 3.3 per cent. Compared with an average area of 570,700 acres for the five years ending with 1953-54, this is an increase of 7.3 per cent. The increase in acreage in the current year is mainly attributed to favourable seasonal conditions. The area estimated is the same as that of last year in the districts of Chingleput, South Arcot, North Arcot, Tanjore and South Kanara and an increase is estimated in the other districts of the State except in the Nilgiris District where the area under cotton is little or negligible. The crop was affected by want of adequate rains in the latter stages of its growth. North Arcot District and by insect pest in Coimbatore District. The condition of the crop in the other districts is generally satisfactory. The seasonal factor for the State as a whole works out to same as that of last year being 97 per cent of the normal. On this basis, the total yield works out to 201,400 bales of 392 lb. lint as against 197,200 bales of 392 lb. lint for the previous year and an acreage yield of 180,100 bales for the five years ending with 1953-54, representing an increase of 2.1 per cent and 11.8 per cent respectively. It is however too early to estimate the yield with accuracy as much will depend upon the future weather conditions.

The wholesale price of cotton lint per standard maund of 32 2/7 lbs. or 3,200 tolas as reported from certain important market centres on the 4th December, 1954 was Rs. 94-11-0 for Coimbatore Cambodia, Rs. 86-14-0 for Coimbatore Karunganni, and Rs. 70-14-0 for Tirunelvelies. Compared with the prices which prevailed during the corresponding period of the previous year, these prices reveal an increase of 3.4 per cent in the case of Coimbatore Karunganni, 109 per cent 1.9 in the case of Coimbatore Cambodia and a decrease of 8.8 percent in the case of Tirunelvelies.

Pepper - Second Forecast Report - 1954-'55 - Madras State: The area under pepper upto 25th December, 1954 in the districts of Malabar, South Kanara and the Nilgiris is estimated at 119,350 acres (101,900 acres in the district of Malabar, 17,300 acres in South Kanara district and 150 acres in the Nilgiris district). Compared with the area of 117,630 acres (101,000 acres in the district of Malabar, 16,500 acres in South Kanara district and 130 acres in the Nilgiris district) estimated for the corresponding period of the last year, it shows an increase of 1.5 per cent. The Seasonal factor is estimated at 92 per cent of the normal for Malabar district, 88 per cent of the normal in South Kanara district normal in the Nilgiri district, as against 90 per cent of the normal in Malabar and South Kanara districts and 95 per cent of the normal for the Nilgiris district, estimated for the corresponding period of the last year. On this basis, the total yield is estimated at 9,200 tons (7910 tons in Malabar district, 1,280 tons in South Kanara district and 10 tons in the Nilgiris district). Compared with the yield of 8,030 tons (7670 tons in Malabar district, 1250 tons in South Kanara district and 10 tons in the Nilgiris district) estimated for the corresponding period of last year it shows an increase of 3.0 per cent. The wholesale price of pepper per maund of 32 2/7 lb. or 3200 tolas on 8-1-1955, was Rs. 105-13-0 for Nadam and Vatakkan varieties, Rs. 123-6-0 for Wynad variety at Kozhikode,

Rs. 1,030-14-0 at Tellicherry and Rs. 101-3-0 at Mangalore. Compared with prices in the corresponding period of the previous year, i. e. those which prevailed on 9-1-1954, these prices show a fall of 62.8 per cent in Mangalore, 51.4 per cent for Nadam and Vatakkan varieties 46.2 per cent for Wynad variety in Kozhikode and 52.4 per cent at Tellicherry.

Onions - First Forecast Report - 1954-'55 - Madras State: The area sown with onions in the Madras State upto 25th December, 1954 is estimated at 21,100 acres. Compared with the area of 18,900 acres estimated for the corresponding period of last, this is an increase of 11.6 per cent. The area estimated is the same as that of last year in the districts of Chingleput, North Arcot, Tanjore, Tirunelveli and the Nilgiris. An increase in area is estimated in all the other districts of the State except in Malabar and South Kanara district where the acreage under the crop is little or negligible. The yield per acre is estimated to be normal in the districts of South Arcot, Salem, Tanjore, and the Nilgiris and slightly below normal in the other districts of the State. The seasonal factor for the State as a whole works out to 97 per cent of the normal which is the same as that for last year. On this basis, the total yield works out to 102,200 tons as against 91,500 tons estimated for the corresponding period of last year representing an increase of 11.7 per cent. The average wholesale price of onions per maund of 82 2/7 lb. or 3,200 tolas as reported from important market centres on 8-1-1955 was Rs. 4-3-0 in Tirunelveli, Rs. 6-5-0 in Wallajah, Rs. 6-0-0 in Mangalore and Rs. 3-10-0 in Tuticorin. Compared with the prices which prevailed on 9-1-1954, these prices reveal a decrease of 41.5 per cent in Mangalore, 39.6 per cent in Tuticorin, 35.0 per cent in Tirunelveli and 19.2 per cent in Wallajah.

Ginger - Second Forecast Report - 1954-'55 - Madras State: The area under ginger crop upto 25th December 1954, in the districts of Madurai, Malabar, South Kanara and the Nilgiris is estimated at 14,880 acres. Compared with the area of 15,250 acres estimated for the corresponding period of the last year, it shows a decrease of 2.4 per cent. Compared with the average area of 12,610 acres for the previous five years ending with 1953-54 the present estimate reveals an increase of 18.0 per cent. A decrease in area is estimated in the district of Malabar and an increase in the other districts. The yield per acre is expected to be normal in the districts of Malabar, South Kanara, and the Nilgiris and below normal in the Madurai district. On this basis, the total yield is estimated at 5310 tons of dry ginger. Compared with the estimate yield of 5440 tons of dry ginger for the corresponding period of the last year, it shows a decrease of 2.4 per cent. Compared with the average yield of 4250 tons of dry ginger for the previous five years ending with 1953-54, the present estimate reveals an increase of 22.1 per cent. The wholesale price of dry ginger per standard maund of 82 2/7 lb. or 3200 tolas at important market centres, on 8-1-1955 was Rs. 79-5-0 for Charnad variety, Rs. 76-6-0 for Ordinary variety at Kozhikode, and Rs. 88-2-0 at Mangalore. Compared with the prices for the corresponding period of the previous year, (i. e. those which prevailed on 9-1-1954) these prices show an increase of 56.9 per cent for Charnad variety, 62.5 per cent for ordinary variety at Kozhikode and 84.6 per cent in Mangalore.

Samai - 1954-'55 First Forecast Report - Madras State: The area sown with Samai (Panicum Miliare) upto 25th September 1954 in the Madras State is estimated to be 212,100 acres. Compared with the area of 2 4,300 acres estimated for the corresponding period of the previous year, this is an increase of 3.8 per cent. The increase is due generally to favourable seasonal conditions in the year under review. The area estimated is the same as that for last year in the districts of Madurai, Ramanathapuram, South Kanara and the Nilgiris. Samai,

is not grown in the Tanjore district. A decrease in area sown with samai is estimated for Salem district and an increase in the other districts of the State. The crop has already been harvested in Malabar district and the yield obtained is reported to be normal. The condition of standing crop is reported to be generally fair.

Korra - First Report - 1954-'55 - Madras State: The area sown with Korra (Tennai or *Setaria Italica*) up to September, 1954 in the Madras State is estimated at 42,700 acres. Compared with the area of 43,500 acres estimated for the corresponding period of the previous year, this is a decrease of 1.8 per cent. The present estimate shows an increase of 3.6 per cent as compared with the average area of 41,200 acres for the five years ended 1953-54. Korra is not cultivated in the district of South Kanara. Sowings of the crop have not yet commenced in the districts of Tanjore and Tirunelveli, where this crop is grown to a small extent. The area estimated is the same as that for the previous year in the districts of Tiruchirappalli, Ramanathapuram, Malabar and the Nilgiris. An increase in area is estimated in the districts of South Arcot, North Arcot and Coimbatore, and a decrease in the other districts viz. Caimgleput, Salem and Madurai. The condition of the standing crop is reported to be generally fair.

Varagu - First Report - 1954-'55 - Madras State: The area sown with Varagu (*Paspalum Scrobiculatum*) in the Madras upto September 1954 is estimated at 291,500 acres. Compared with the corresponding estimate of 278,300 acres for the previous year, this is an increase of 4.7 per cent. The area estimated is the same as that for last year in Tirunelveli district. A decrease in area is estimated in the districts of Salem, Tiruchirappalli and Madurai and an increase in the other districts of the State except South Kanara and the Nilgiris where the crop is not raised. The condition of standing crops is reported to be generally fair.

FACTS AND FIGURES

One cheap and effective way of preventing river bunds being washed away by seasonal floods in planting such grasses as *Kusha*, Giant Star and Thin Napier. The grasses bind the soil and keep the bunds intact.

Eggs meant for hatching should be stored in a room free of smell such as of onions, kerosene oil, etc. The eggs should be stored with their large end up.

Serving a cow soon after calving results in a low conception rate. The best way would be to avoid mating the cow during the two heat periods following calving.

There are 1.51 million acres under coconuts in India annually producing coconuts valued at Rs. 78/- crores. Two-thirds of the area is in Kerala.

In the present day crop production over 70 per cent of the cultivated area is cropped with cereals as against less than 5 per cent with pulses. Pulses are nitrogen recuperating crops, and should be included in the cropping programme to a greater extent.

—[I.C.A.R. FARM NEWS RELEASE NOTE].

Weather Review — For the month of January, 1954.

RAINFALL DATA (IN INCHES)

Division	Station	Total rainfall for the month	Departure from normal	Total since 1st January	Division	Station	Total for the month	Departure from normal	Total since 1st January
North	Madras (Meenam-bakkam)	4.6	+ 3.2	4.6	South	Madurai	0.3	— 0.5	0.3
	Tirur-kuppam*	4.9	+ 3.7	4.9		Pamban	5.2	+ 2.6	5.2
	Vellore	1.8	+ 0.3	1.8		Koilpatti*	2.5	+ 1.5	2.5
	Gudiyatham*	1.8	+ 1.4	1.8		Palayam-cottai	1.9	+ 0.2	1.9
						Amba-samudram*	4.9	+ 1.8	4.9
East Coast	Palur*	2.6	+ 0.3	2.6	West Coast	Trivandrum	0.3	— 0.5	0.3
	Tindivanam*	0.5	— 1.0	0.5		Fort Cochin	0.1	— 0.8	0.1
	Cuddalore	1.9	— 0.5	1.9		Kozhikode	2.0	J. N.	0.2
	Naga-pattinam	2.7	J. N.	2.7		Pattambi*	Nil	— 0.1	Nil
	Aduturai*	1.1	— 0.6	1.1		Taliparamba*	Nil	— 0.2	Nil
Central	Pattukottai*	3.2	+ 1.3	3.2	Hills	Wynad*	Nil	— 0.4	Nil
	Salem	0.1	— 0.2	0.1		Nileshwar*	Nil	— 0.2	Nil
	Coimbatore (A. M. O.)*	0.3	— 0.2	0.3		Pilicode*	Nil	— 0.2	Nil
	Coimbatore	0.6	J. N.	0.6		Mangalore	Nil	— 0.3	Nil
	Tiruchirappalli	0.8	J. N.	0.8		Kankanady*	Nil	— 0.1	Nil
						Kodaikanal	2.4	— 0.8	2.4
						Coonoor*	4.4	+ 0.4	4.4
						Ootacamund*	0.9	+ £ ₁	0.9
						Nanjanad*	0.7	— £ ₂	0.7

Note:—1. * Meteorological Stations of the Madras Agric. Dept.

2. £₁ Actual figure is 0.04.

3. J. N. = Just Normal.

4. £₂ = Actual figure is 0.01.

The weather in the first three days of the month was practically dry except for an isolated heavy fall of 3.3" at Pamban on 3-1-1955. The next day very light showers were received at a few places in Coastal Tamilnad. In the subsequent three days weather was mainly dry. On 8-1-1955 an active zone of convergence was noted extending from Trivandrum to Madras, with the result that showers were moderately widespread in South Tamilnad. Fairly widespread showers were received in different parts of Tamilnad in the succeeding three days. Then again the weather became dry and remained so for three days with the exception of a few light showers in Coastal Tamilnad on 14-1-1955. A few places in North Tamilnad had some showers on 15-1-1955 and the weather in the rest of the region was dry.

On 16-1-1955 an active easterly wave was found approaching Coastal Ceylon and South Coastal Tamilnad. The remaining portion of the month upto and inclusive of 28-1-1955 passed off with practically dry weather with the exception of a few localized showers in South Tamilnad. Even these light showers in South Tamilnad were received at intervals of two to three days, when bright sunny weather was experienced. In the last three days the weather was mainly dry throughout the Madras State.

The note-worthy rainfalls and the zonal rainfall in inches are furnished hereunder:

Note-worthy Rainfalls			Zonal Rainfall			
Date	Name of Place	Rain-fall	Name of Zone	Av. rainfall for Dec.	Dep. from normal	Remarks
3/1/55	Pamban	3.3	North	3.3	+ 2.2	Above normal
9/1/55	Madras (Nungambakkam)	2.9 on each day	East Coast	2.0	- 0.1	Just Below normal
9/1/55	Madras (Meenambakkam)	1.5 on each day	Central	0.5	- 0.1	Below normal
10/1/55	Cuddalore	1.0	South	3.0	+ 1.1	Above normal
9/1/55	do. Kallakurichi	1.0	West Coast	0.1	- 0.3	Below normal
10/1/55	Kodaikanal	1.0	Hills	2.1	- 0.1	Just above normal
21/1/55	Nagapattinam	1.0				

Agricultural Meteorology Section,
Lawley Road P. O.,
Coimbatore.

C. B. M. & M. V. J.

FIELDMEN'S ASSOCIATION, LAWLEY ROAD P. O., COIMBATORE

The Annual General Body Meeting for the year 1954 of the Fieldmen's Association, was held on 3-2-55 under the Presidentship of Sri C. S. Narayanaswamy Iyer.

The following persons were elected as office-bearers of the year 1955:

Sri S. Kalyanasubramaniam of Paddy Section as President.

Sri A. Adiopatham of Cotton Section as Secretary.

Sri Venkatarasimhan of Mycology as Assistant Secretary and Treasurer.

Messrs. M. Saravanasubramaniam of Paddy Section, Ponnuswamy of Oil Seeds Section, Venkaramanan of Fruits Section, Sri Krishnaswamy Naidu of Millets Section, Ranganathan and Rajamani of Entomology Section as Committee Members.

A. ADIAPATHAM,
Secretary.

DEPARTMENTAL NOTIFICATIONS Gazetted Service — Postings and Transfers

Name and present post	Posted as
Abraham, Dr. P. Plant, Physiologist, Coimbatore,	Officer, in Spl. Duty, (Spices), I. C. A. R.
Kalyanasundaram, N. V., (On leave)	Agronomist, Satyamangalam.
Krishnamurthy, R.,	Cotton Extension Officer, Madurai.
Krishnaswami, P. N., Cotton Extension Officer, Madurai,	Asst. Cotton Specialist, Coimbatore.
Kunhiraman Menon, Asst. in Chemistry, Coimbatore,	Asst. Agrl. Chemist, Tanjore.
Kunhikoran Nambiyar, A., Asst. Millets Specialist, Coimbatore,	Millets Specialist, Coimbatore.
Nayer, P. N., (On leave)	Asst. Marketing Officer, Trichy.
Narayanaswami, S., Asst. Agl. Engineer, Ootacamund,	Asst. Soil Conservation Officer, Ooty.
Syed Mohmad, P. P., D. A. O., Madras,	For Services in Pondicherry.
Thomas, K. C., D. A. O., Madurai,	Asst. Marketing Officer, Madras.

Upper Subordinates — Postings and Transfers

Name and present post	Posted as
Abubucker, D. Agl. Lec., Gandhipuram,	A. D., Wandiwash.
Achuthan Nair, E., (On return from deputation,	P. P. A., Myco. Tellichery.
Alagamuthu, N., A. D., Cuddalore,	To Work in Pondicherry.
Balasubramaniam, V., O. S., Asst. Nileshtar,	Coconut Nursery Asst. Pattukottai.
Bakthavathasalu, Fruit Asst. A. D. T.,	Statistical Asst. in Meteorology, Coimbatore.
Doraiswami, G., A. D., Bhavani,	A. D., Coimbatore.
Ganesha Pillai, S., F. M., C. F., Coimbatore,	F. M., Bhavanisagar.
Gopalakrishnan, S., Asst. in P., Physiology, Coimbatore,	Groundnut Physiologist, Coimbatore.
Jayaraja, R., Agl. Lec., Pattukottai,	P. P. A., Mycol., Pattukottai.
Krishnamurthy, C., F. M., Satyamangalam;	F. M., Bhavanisagar.
Kannan, Asst. Cotton Specialist, Coimbatore,	Cotton Asst. Coimbatore.
Kuruvilla, M. J., P. P. A., Tellichery,	Spl. A. D., Lower Bhavani Project, Satyamangalam.
Krishnamurthy, N., A. D., Gingee,	To Work in Pondicherry.
Lingannan, K. A. D., Conjeevaram,	Agrl. Engineering Supervisor, Tellichery.

Name and present post	Posted as
Nagarajan, S. S., Pady Asst. Coimbatore,	Asst. Groundnut Physiology, Coimbatore
Narasimalu, T. R., Soil Conservation, Kothamangalam,	Agri. Engineering Supervisor, Mayuram.
Parthasarathy, D. R., A. D., Avoor,	A. D., Keelamangalam.
Radhakrishnan, T., P. Physiology Asst. Coimbatore,	Chemistry Asst. Coimbatore.
Ramanarayana Menon, K. O. S., Asst. Nileshtar,	Analyst, Coimbatore.
Ranganathan, K. S., A. D., Coimbatore,	O. S. Dev. Asst. Coimbatore.
Rajagopalan, M., A. D., Vridhachalam,	To work in Pondicherry.
Rajan, M. Spl. A. D., Lower Bhavani, Satyamangalam,	A. D., Bhavani.
Sundararaj, M. S., A. D., Tirupur,	Fruit Asst., Coonoor.
Sahadevan, P. C. (on leave)	Asst. in Paddy Coimbatore.
Shanmugam, C. T., A. D., Madurantakam,	O. S. D. Asst., Pollachi.
Sankara Subramaniam, C. K., P. A. to D. A. O., Tirunelveli,	F. M., Bhavanisagar.
Sivasubramaniam T., S. D. A., Guindy,	F. M., C. F., Coimbatore.
Somalingam R., A. D., Madanam,	Agri. Eng. Supervisor, Kumbakonam.
Thejamurthy, P. S., A. D., Mailam,	To work in Pondicherry.
Venkatrama Iyer, A. D., on leave,	A. D., Tindivanam.
Venkatarangam, R., P. P. A. Myco. Pattukottai,	Spl. A. D., Vellore.
Veeraraghavan, S. N., A. D., Vedasandur,	Agri. Lec. Gandhigram.
Venkateswaran, A. N., Groundnut Nursery Asst. Pattukottai,	Asst. Groundnut Physiology, Coimbatore.

Marketing Committee Chronicle

Regulating the Marketing of Groundnuts in North Arcot District

by

K. SRIRAMAN, B. Sc. (Ag.), M. Sc.,
Secretary, North Arcot Market Committee, Vellore

Many have asked the question as to what exactly are the functions of the Market Committees constituted under the Madras Commercial Crops Markets Act 1933, and what their achievements are. In this article, the problems of the North Arcot Market Committee, which began functioning from November 1953 are briefly discussed just to give an idea of the role of market committees, indicating also as to what better marketing regulations can do.

The two main functions enjoyed under the Madras Commercial Crops Markets Act, on the North Arcot Market Committee are (i) to provide for the better regulation of buying and selling of groundnuts in North Arcot district and (ii) the establishment of markets for the commercial crops notified, namely groundnuts. Groundnuts include both the pods (unshelled) and kernels (shelled). Better regulation of the groundnut trade necessarily means the licensing of traders, so as to obtain from them, the necessary information regarding their transactions. These data obtained from the licensees enable a study of the flow of trade. In North Arcot, where nearly 1½ lakh tons of groundnut pods are produced annually, mostly as a rainfed crop, coming to harvest in the months of October to December it is common for all and sundry, who have some surplus money to spare, to invest it in the purchase of groundnut pods, stock it for some time and sell it at the higher prices, if possible, being a commodity which can readily be sold. These intruders in the groundnut trade, mostly avoid taking licences and payment of levy fees to the market committee as also taxes due to Government as they are casual purchasers of small quantities. Such unlicensed traders have the potentiality to upset the normal trend of the trade, by selling their produce in a panic at cheaper prices, in a falling market, as they lack the staying power. The prices of groundnut reacts to the export demand, and the local prices are never steady, with the result that it has become a paradise of the gamblers. Licensing under the Madras Commercial Crops Markets Act rigorously keeps out hectic investors and the groundnut market is bound to be more steady in due course.

There are a number of malpractices in the groundnut trade at present in North Arcot district. At Vellore 179 lb. of kernels are weighed instead of the standard 177 lb. per bag for which the prices are offered. These two pounds of kernels in each bag would cost at the present rate, nearly seven annas, which is a loss to the grower. These frauds in weightment are checked by licensed 'weighmen'. The staff of the committee, visit the trading premises frequently and see that correct weightments are ensured. Gradually, the practice of weighing correctly, and at the rate of 177 lb. per bag of kernels, would be well established.

Purchases of pods are being made at present by volume measures. According to the Madras Commercial Crops Markets Act, transactions by weightments only are allowed. As per volume measures, 64 Madras measures of pods go to make a bag, for which the price of a 80 lb. pods bag is paid. Actually these 64 measures of pods weigh up to 90 lb. even, according to the excellence of the produce. In the volume measurement, good quality produce is not paid its proper price. A loss of at least 4 lbs. per bag on an average, come to nearly fourteen annas, which is sustained by the farmer when he sells a bag of pods, by volume measure. The Committee staff is educating the ryots to sell the pods by weight only and is also trying to check traders in this practice, by the enforcement of the provisions of the Act.

Pods are sold by the ryots in North Arcot district in a wet condition, soon after harvest. The prices paid for wet pods are considerably low. At present, a bag of wet pods (64 Madras Measures) is purchased only for about Rs. 8/- while the dry pods bag (64 Madras Measures) is sold at Rs. 11/- nearly. A gain of Rs. 3/- per bag is effected by the traders, on the purchase of these wet pods, while they approximately loose by driage at best 8 Madras measures per bag which would work out to only rupee one in terms of money. Hence, the net gain to the trader for each bag by purchasing wet pods is roughly estimated as Rs. 1—12—0 taking into consideration the cost of processing the pods. The ryots are being advised to sell only as dry pods after drying in their places, so that they may gain this amount.

The producers would stand to gain by marketing their produce, after processing as far as possible. The shrewd trader, always estimates the losses in processing, in excess only and to that extent, the agriculturist is the loser. The percentage out turn of kernels to pods by weight on a commercial scale, is about 68 in the case of bad pods, 71 to 72 for good pods of the spreading variety and 72 to 73 for good pods of the bunch variety, in North Arcot district. Generally, the trader calculates on the basis of 9 bags of pods to three bags of kernels, (one candy of 531 lbs.), when the produce is very good, which works out to a percentage outturn of 70, while actually it is anywhere about 72 or 73. This underestimate of 2% works out to nearly twelve annas per bag

of kernels which is the loss sustained by the grower while marketing his produce as pods instead of kernels. The loss is more, if the pods are wet, as the trader is sure to estimate the loss of moisture, at a safer level advantageous to him. The pods received in the markets of the North Arcot district during October 1954 were poor in quality, as there were no rains in September and the traders took advantage of the same, and began purchasing pods on the basis of 11 bags pods for 3 bags of kernels. Actually, when decorticated, it worked out at the rate of 10 bags pods per candy of kernels. Again the price of 9 bags of pods at Rs. 11/- at present per bag, works to Rs. 99/- only, and along with Rs. 1—8—0 for decortivating charges amounts to Rs. 100—8—0 per candy of kernels while the present price is about Rs. 105/- to 108/-. Hence, the ryot loses nearly Rs. 6/- per candy or Rs. 2/- per bag of kernels when he sells it as pods. Further, the grower would gain more, if he should market his produce as kernels, as the space required for kernels is less, and hence, he can carry more bags to the market in his bullock cart, than he is able to do in the case of transport of pods. The South Arcot ryots bring only kernels to the market for sale. Such practice is being advocated by the market committee staff in North Arcot district.

The above are some of the problems tackled for the regulation of the trade in groundnuts in North Arcot district. The provision of regulated markets in the important assembling centres for enabling the producers to market their produce direct to the consumers or exporters, avoiding the long chain of middleman, as obtaining now, is the other important objective, which has been tackled, by establishing a regulated market each, at Vellore and Tiruvannamalai. The Government recently sanctioned the opening of three more regulated markets at Tirupattur, Arni and Arcot. These five markets would benefit the trade evently throughout the district. In these regulated markets, any one can bring his produce for sale and have the services of the market committee for disposing of the same by auction. The service is free. At present, the village and the itinerant merchants, procure the produce from the grower, bring it to the big traders in the towns, who in turn, have it sold to the consumers like the oil crushers or to the exporters. There are brokers in between, at times and with such an array of traders in the marketing of groundnuts, it is no wonder, the grower gets only about 70% of the consumer's price. When the produce is marketed through the regulated markets of the committee, the price spread shows that the producer gets nearly 90% of the consumer's rupee.

**“Biligotu” or “Chali Supari” (Mature, whole, sun dried
Arecanuts) of South Kanara**

by

K. TEJAPPA SHETTY, B. Sc. (Ag.), D. I. H.,
Secretary, South Kanara Market Committee

and

M. PUNDALIK HEGDE,
Supervisor, South Kanara Market Committee

Arecanut (*Areca catechu*) though grown over an area of only 23,707 acres in the district of South Kanara, plays yet an important role in the economic welfare of a large number of villages especially some of the interior villages of the district where, even lands which could not usefully be utilised for any other crop production, have been brought into flourishing arecanut gardens with the result that the district is to-day exporting over 2,00,000 cwt. of arecanuts per year valued at over three crores of rupees. It is the only area in the country where practically the whole of the production is harvested when the nuts are fully ripe and converted into “Chali supari” which is in great demand in Northern and Central India. “Chali supari” of Mangalore is noted for its superiority over nuts of North Kanara and parts of Malabar and is found to have better demand and better prices.

Preparation. The nuts are harvested when they turn yellowish on the tree and are fully ripe. These are immediately spread evenly on a level ground for sun-drying and dried thus for 40 days with regular turning of the individual nuts to enable uniform drying. A regular watch has to be kept during the period which will cost about Re. 1/- per Cwt. of nuts on an average. The nuts are then husked at Re. 1/- per Cwt. and the inferior and blackened nuts separated and sent to the market for sale.

Transport. There are regular goods transport lorry services available from practically every part of the district and the cost of transport is Rs. 1—8—0 per Cwt. on an average.

Assembling. The main or practically the only assembling centre for arecanuts in the district is Mangalore which is the only export market. Though there are a few dealers who purchase the produce from the growers in the interior villages, the whole quantity finally is sent to Mangalore for sale and export.

Marketing. There are a number of commission agents at Mangalore with sufficient number of godowns to stock and arrange for the sale of arecanuts received from the villages. The sale is done under cover of cloth with a number of shippers bidding at the sales. The commission

agent not only gives advances on the produce brought for sale through him but also gives credit to the shippers on his own responsibility. “Supari” trade may be said to be one of the major trade transactions in the Mangalore market. The commission for the sale is paid by the grower which is now fixed at Rs. 3—8—0 per cwt. by the regulation of the Market Committee. This commission includes all the charges including godown rent, weighment, etc. The produce is sold as received from the growers without any further grading or sorting.

Shipping. The shipper immediately on purchase fumigates the arecanuts with sulphur-dioxide, then grades it through sizers for the different consuming markets mainly into four grades:

1. Moti special – 1” and over in diameter.
2. Srivardhan special – 0.9” and over but below 1”.
3. Jamnagar special – 0.8” and over but below 0.9”.
4. Jeeni special – under 0.8”.

All discoloured and broken nuts etc. are handpicked and separated. The nuts are now ready for shipment. These are generally packed in new double gunnies, stitched, marked and tied over with coir ropes. The average expenditure by the shipper is Rs. 7/- per cwt. as shown below for a shipment of 188 cwt. shipped from Mangalore to Bombay :-

	Rs.	As.	Ps.
Charity	...	18	14 3
Manifest writing	...	1	0 0
Dock fees	...	12	7 6
Freight	...	380	4 0
Marketing the bags	...	6	9 3
Stitching charges	...	22	4 3
Coir rope and tying	...	30	5 0
Labour charges	...	117	15 6
Boat hire	...	84	12 6
Weighment	...	2	5 9
Gunnies	...	305	15 6
Tarpaulin charges	...	1	5 0
Insurance	...	198	6 0
Hundi discount	...	39	12 0
Fumigation	...	35	6 3
Export fees	...	23	10 3
		1,281	4 9
Clerical charges etc.	...	34	11 3
Total for 188 cwt.	...	1,316	0 0

The commission for the shipper at Mangalore is paid at $1\frac{1}{2}$ to 2% of the cost of supari which works out to about Rs. 3/- per cwt. at present. So, the total cost of marketing till the produce reaches Bombay per cwt. is :-

	Rs.	As.	Ps.
Drying the nuts	1	0	0
Husking	1	0	0
Transport	1	8	0
Seller's commission	3	8	0
Handling, freight etc. charges	7	0	0
Shipper's commission	3	0	0
Total	17	0	0

The quality of "Chali supari" of this district has to be kept up by the growers by strictly conforming to the complete drying of the nuts for 40 days, so that the market favour for Mangalore supari may be kept up. Due to the high prices of "Supari" during 1953-1954 season, even partially dry nuts were brought and sold in the Mangalore market but this if continued may affect the whole market for Mangalore "Supari." The scope for reducing the charges of marketing and thus increasing the return to grower has to be explored.

Pollachi as a centre for Marketing of Groundnuts

Groundnut as a commercial crop in the Coimbatore district is next in importance only to cotton. Out of the total groundnut area of 2,30,000 acres and a production of ten lakhs bags of kernels, of the district, the Pollachi taluk possesses a little less than half of the area and a crop of more than fifty per cent of the production. Pollachi being situated in a line with the gap of the western ghats has its own rainy season commencing in March-April and the cultivation season of the groundnut crop therefore commences during the months March-April and lasts till July-August, when it is harvested. The Pollachi production season therefore does not correspond either to the winter or to the summer seasons known as such, but is specifically known as the early winter season of Pollachi. Two important varieties are grown in this taluk. They are (1) Pollachi red, a bunch variety and (2) white, a spreading variety. Recently a white bunch variety known as 'College Kothu' is being tried, but the acreage under this variety is almost negligible. The famous red variety known as 'the Pollachi red' dominates the area occupying as it does four fifths of the total groundnut area of the taluk. The soil of this area is either red sandy loam or sandy loam and is best fitted for the cultivation of groundnut.

There are thirty-five oil mills in the taluk fitted with either rotaries or expellers and they have groundnut decorticators as an essential feature of the equipment. The quantity of groundnut kernels marketed in this area normally ranges from five lakhs to six lakhs of bags of kernels representing as pointed out above more than fifty per cent of the district production. Consumption by local mills is about a lakh of bags and exports to other districts amount to three lakhs of bags, while about two lakhs of bags are consumed by the oil crushing industry of the district outside the Pollachi taluk. The groundnut crop of this area happens to be marketed at that period of the year when it is not available at any other centre of India and consequently buyers from all parts of India are attracted to this market and the marketing activity proceeds actively and energetically within a short period of three months as the buyers are in the habit of covering their requirements rapidly without maintaining an establishment over a long period. Commercially the chief attraction is the red variety, the oil content of which exceeds that of any other known variety.

The Coimbatore taluk Committee's regulated market at Pollachi is located in the buildings known as 'the Rallis Godowns' situated on the Goodshed Road of the town. The place has decent godowns put up all round in a square fashion, with a drying floor in the centre. The comment of trade on the market premises is that it is insufficient for accomodating a crop so large as that of Pollachi, marketed rapidly within three months. The Committee deems it suitable for a start. This market was opened on 3-3-1954. With a view to attracting arrivals of the groundnut crop directly from growers to this market propaganda in an active form is being carried on.

Superintendent,
Coimbatore Market Committee,
Pollachi.

Regulated market in the Gobichettipalayam Taluk

The taluk of Gobichettipalayam is noted for cultivation of the commercial crops, like cotton, groundnut and tobacco, but is prominent as a production centre of tobacco of the best varieties popularly known as 'the Meenampalayam tobacco'. The cotton area of this taluk is 14,000 acres and a crop of one lakh of pothis (one pothi=280 lb.) of Combodia kapas or approximately 10,000 candies (one candy=784 lb) of lint is raised from the area. A groundnut crop of two and a half lakhs bags of pods (one bag=80 lb.) is raised from an area of 25,000 acres. The tobacco area is 3,500 acres and the crop produced is about 10,500 cd. (one cd. = 500 lb.) The cotton crop of this taluk stands to improve in size and quality in view of facilities proposed to be afforded by the Lower Bhavani Project.

Such hopes are not cherished regarding groundnut in this taluk which however may be expected to be steady on the basis of the existing acreage and yield. The trend of tobacco cultivation in this area is also not towards expansion under the cheerless conditions brought about by prices which hitherto were discouragingly low.

In an area which produces all the three leading commercial crops, the prime need of the growers is a regulated market for obtaining them fair prices for their produce. In shandies and in private premises the growers are practically helpless and sell in ignorance of the market rates and are for the most part losers. In their dire need for money distress sales are made by them at prices very much off the market rates and on other terms unfavourable to themselves. The zeal for cultivation receives a shock when the actual proceeds of sale are counted. Real succour to the cultivators at the stage of marketing can be imparted only by a regulated market.

Though after some delay, the Committee's regulated market has been opened at Gobichettipalayam. It is housed in the buildings and premises of Sri D. Sreenivasa Iyer situated on the Modachur Road. The Market was opened on 14-4-1954. The function was attended by a very large number of growers. Most of them participated in the function making enthusiastic speeches in welcoming the market. This market started working after the best part of the cotton season was over and nevertheless the record of sales effected shows about a thousand pothies of kapas marketed at rates ranging from Rs 135/- to Rs. 145/- per pothi which prices are considered encouraging. My experience of the attitude of the people in villages towards regulated markets is really heartening. If once, they know clearly what a regulated market stands for, they would not like to miss availing themselves of the facilities provided to them. In order to educate them on the subject propaganda by pamphlets is being carried on. It is also proposed to feature the market through slides of the cinema.

*Market Yard Superintendent,
Coimbatore Market Committee,
Gobichettipalayam.*

MARKET NOTES AND PRICES SUPARI—MANGALORE

Market conditions of Supari (Arecanut) and Coconuts at Mangalore during January 1955 as reported by the South Kanara Market Committee.

1. The range of market prices for the month:—

For the week ending	Koka Rs.	Choll Rs.	Malabar supari Rs. (per cwt.)	Mangalore supari Rs.	Copra per candy of 660 lbs. Rs.	Coconuts per 1000 nuts Rs.
6-1-1955	70 to 105	145 to 168	110 to 128	125 to 146	320 to 340	Raw-160 to 185 Dry -180 to 260
13-1-1955	65 to 115	150 to 174	do.	125 to 148	do.	R. do. D. do.
20-1-1955	do.	150 to 184	do.	do.	do.	do.
27-1-1955	do.	do.	115 to 128	do.	315 to 335	do.

2. The estimated stocks held and exports ("SUPARI") :—

Opening Balance Cwt.	Receipts Cwt.	Exports Cwt.	Closing Balance Cwt.
3,700	25,000	23,978	4,722

The price of "Supari" was firm during the month with a gradual increase in the price of "Choll" nuts. There was a sudden fall in price of copra towards the end of the month because of low prices in Cochia. Coconut prices continued to be steady and firm.

Mangalore,
5-2-1955.

*Secretary,
South Kanara Market Committee.*

The Weekly Average Prices of Commercial Crops in the Markets in South Arcot District for January 1955.

Markets of South Arcot Market Committee	Week Ending 7-1-'55		Week Ending 14-1-'55		Week Ending 21-1-'55		Week Ending 28-1-'55		For January 1955	
	Arrivals in Tons	Average Price per Candy	Arrivals in Tons	Average Price per Candy	Arrivals in Tons	Average Price per Candy	Arrivals in Tons	Average Price per Candy	Arrivals in Tons	Average Price per Candy
Groundnuts Kernels	Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.	
Vridhachalam	.. 589	90 0	303	95 13	263	92 13	457	93 2	1722	95 2
Villupuram	.. 342	95 12	169	89 12	97	89 8	173	86 4	845	90 5
Tindivanam	.. 728	96 12	336	94 6	283	93 12	524	90 14	2710	89 12
Tirukoilur	.. 314	94 11	202	91 12	168	92 5	190	87 12	930	90 4
Cuddalore OT	.. 72	95 12	52	89 15	31	91 10	13	90 6	181	91 11
Panruti	.. 75	90 11	43	87 12	26	81 15	59	85 0	211	86 6
Chinnasalem	.. 66	91 6	28	93 4	32	87 6	28	84 8	159	89 0
Ulundurpet	.. 73	90 2	57	86 0	30	89 8	61	82 4	237	85 0
Gingelly Price per Bag of Two Imperial Maunds.										
Vridhachalam	.. 84	39 5	83	39 12	88	37 6	60	37 8	330	37 11
Cotton Price per Pothi of Two Hundred and Eighty lbs. Kapas.										
Villupuram	.. 1	82 0	..	..	..	..	..	..	1	82 0

N. B. Bag—177 lbs. kernels net; Candy—531 lbs. kernels net;
Ton—12.6 Bags kernels.

Notes on Crop Condition, weather etc.,

Harvest of winter groundnut crop concluded. Sowings of summer crop commenced in parts. Arrivals declined due to a fall in prices of kernels consequent on declining prices of oil. Arrivals of gingelly and cotton to Vridhachalam and Villupuram markets respectively were poor.

Cuddalore, }
11-2-1955. }

Secretary,
South Arcot Market Committee.

Market Conditions of Cotton at Kovilpatti during January, 1955 as Reported by the Tirunelveli Market Committee, Kovilpatti.

1. The range of market prices for the month.

For the week ending	LINT (Candy of 784 lb.)				KAPAS (Pothi of 280 lb.)				COTTON SEEDS (Pothi of 280 lb.)			
	Karunganni		Uganda		Karunganni		Uganda		Karuganni		Uganda	
	1st Quality	2nd Quality	1st Quality	2nd Quality	1st Quality	2nd Quality	1st Quality	2nd Quality	1st Quality	2nd Quality	1st Quality	2nd Quality
6-1-1955	Rs. 730 to 760	Rs. 620 to 730	Rs. 1,160 to 1,240	Rs. 975 to 1,060	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. 27	Rs. 25 to 26	Rs. 22-8-0 to 26	Rs. 17 to 19-8-0
13-1-1955	Rs. 730 to 750	Rs. 700 to 720	Rs. 1,190 to 1,210	Rs. 1,100 to 1,120	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. 26-8-0	Rs. 25-12-0	Rs. 24	Rs. 22
20-1-1955	Rs. 740 to 750	Rs. 700 to 730	Rs. 1,200 to 1,220	Rs. 1,000 to 1,020	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. 24	Rs. 22-12-0	Rs. 25	Rs. 20-8-0
27-1-1955	Rs. 690 to 700	Rs. 650 to 680	Rs. 1,190 to 1,200	Rs. 1,100 to 1,120	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. No Stock	Rs. 25	Rs. 22-12-0	Rs. 24	Rs. 22-12-0

2. The cotton market was generally steady for most part of the month but turned out to be weak towards close. Forward contracts to the tune of about 500 candies were entered on behalf of mills at prices varying from Rs. 890 to 696 per candy. The trend appears to be weak and prices are likely to be lower than that of the last season.

Secretary,
Tirunelveli Market Committee.

Kovilpatti,
10-2-1955.

OBITUARY

T. V. RANGASWAMY

We deeply regret to record the untimely demise of Sri T. V. Rangaswamy, Assistant Cotton Specialist, at the early age of 47, after a brief illness at his native place, Tiruvarur. Born on 26th January, 1908, he joined the Madras Agricultural Department as Assistant in Cotton in 1929 after graduating from the Agricultural College, Coimbatore.

He was reputed to be one of the hard working, sincere and outstanding workers in the Department. He used to reveal an astounding intimacy with cotton breeding material and was very intimately connected with the breeding of long staple American cotton in Madras, particularly with the evolution of strains Madras Cambodia Uganda - 1 and Madras Cambodia Uganda - 2.

He was promoted to the Gazetted cadre as Assistant Cotton Specialist in March, 1947.

He was suffering from cardiac trouble for the last one year, but his end was sudden and unexpected. He leaves behind his wife, four sons and a host of relatives and friends to bemoan his loss.

May his soul rest in peace.

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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