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The Madras Agricultural Journal

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Editorial

Self - sufficiency of Food: As Roosevelt said "Food will continue to be weapon in all efforts towards ensuring a more orderly, prosperous and peaceful country". At the present juncture, the Indian Republic is deficient especially in her needs of vital food and these deficits show a trend of becoming greater as years pass. The normal food deficit in the Madras Presidency is about 1 million tons, mostly of rice and a little of millets but with the failure of the monsoons in the State for a number of years in succession and the havoc caused by the periodic cyclones, the situation has become really grave. Apart from basic food crops, other supplemental foods also need to be produced in greater quantities. Increased production in agriculture is a complex matter requiring the simultaneous application of a number of different measures, but varying with different sets of conditions. It needs the help and co-operation of all – the State, the public and the consumer to achieve these targets, On the State falls the responsibility of launching programmes for this purpose and on the public rests an equal share of the responsibility to co-operate with the Government and promote the working of these schemes.

Of the methods that should be useful in increasing food production – say Rice – which is the most deficient, the increase of yield per acre is the quickest and this can be achieved only with adequate and timely supplies of water and manure. Every bit of waste material should be turned into compost as the Japanese and Chinese have successfully done to serve as food for the crop, or build up soil fertility. Land should be grown with proper seeds which have been evolved by the Agricultural Department to serve different localities and needs. Everybody should endeavour his or her little mite to contribute to good production by growing some plant, yielding food, vegetables or tubers. To attain this self-sufficiency more effectively at every stage of its culture and use, losses should also be minimised; labour should be sympethetic; house-wives should practice domestic economy and people should shun the black market.

With these ameliorative methods, the time should not be distant when we could make the country self-sufficient with regard to food.

RETIREMENT

Sri V. K. Subramania Mudaliar, Headquarters Deputy Director of Agriculture, Madras, retired from service on 9th January 1953. He took his diploma in Agriculture at the Agricultural College, Coimbatore, in 1921 and entered service in March 1922, at Koilpatti. Earnestness, sincerity, zeal for work and uprightness have been his outstanding characteristics right through and these appealed to all alike, subordinates, collagues and superior officers with whom he worked. He became the Superintendent of the Agricultural Research Station, Koilpatti in 1929 and laid the foundation for systematic breeding and evolution of superior karunganni cotton strains. The karunganni cotton strain K. 1, reputed for its fine, and long staple and high spinning values, was evolved by him. He also laid the foundation for evolution of *Mungari* cotton strains at Adoni and the breeding of potatoes at Nanjanad. His name will be always associated with the work at these Research Stations. The results of his pioneering work in the thirties are to-day seen in the different popular strains that are pouring out from them.

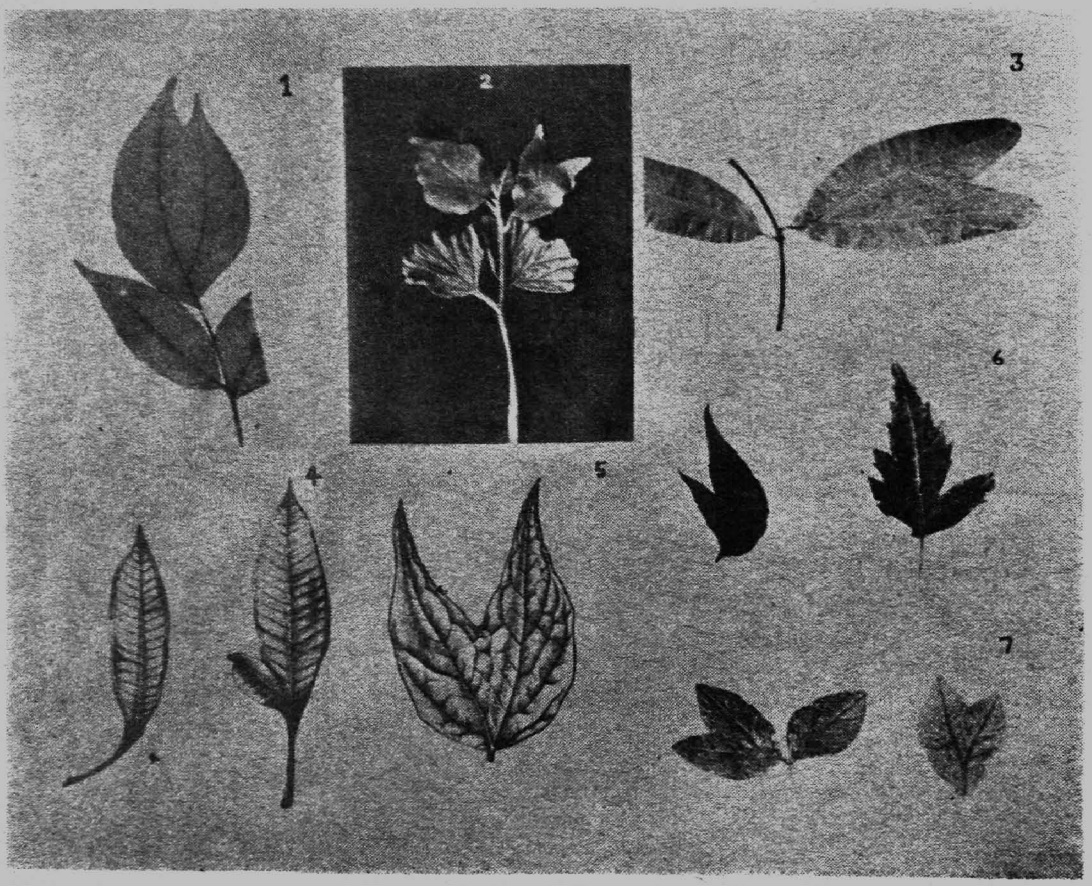
Later, he became Assistant Director of Agriculture in 1941, Regional Deputy Director of Agriculture in 1946 and Head Quarters Deputy Director of Agriculture in 1948. His early training at the Agricultural Stations were thus usefully employed in extension work. His rich practical experience thus became the store from which the several Officers of the Department drew inspiration and strength and his absence will be keenly felt by one and all.

We wish him happiness and a long and healthy retired life.

OUR NEW PATRON

The Madras Agricultural Students' Union extends a hearty welcome to its new patron Sri A. K. D. Balarama Raju of Rajapalayam. He is our old boy of the Agricultural College, Coimbatore. He is a big land-lord, evincing a lively and keen interest in the recommendations of the Madras Agricultural Department. The zeal with which he used to attend the College Day and Conference practically every year is an ample proof by itself for his thrist for knowledge on practical agriculture. He is a member of the Provincial Livestock Improvement Board. Till recently he was a member of the Indian Central Cotton Committee and also the Madras State Cotton Committee.

The Union is really glad to have him as one of its patrons.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The Phenomenon of Leaf-Forking in a Few Dicotyledonous Plants

By

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The forking of the simple entire leaf into two lobes at its apex is a phenomenon not commonly met with in plants. It is only in some of the ornamental foliage plants as the *Codiaeum* spp., this occurs frequently. However, instances of leaf forking has been recorded in a few plants.

Sabnis (1931) has recorded the forking of leaves in *Michelia champaca* and *Anacardium occidentale* both having alternate leaves. The same author (1934) noted the fission in the leaflets of *Phaseolus radiatus* and *Phaseolus mungo*. Leaf forking in other plants which have alternate leaf arrangement has been noted in *Aralia guilfuylei* (Saran 1934) and *Olax wightiana* (Govindu et al 1946). In plants with opposite leaves as *Tabernaemontana coronaria* (Rao 1934), *Eranthemum atropurpureum* (Singh 1935), *Psidium guava* and *Memecylon umbellatum* (Govindu et al. 1946) also the phenomenon has been noted.

In this note the forking of leaves and leaflets in seven species is recorded.

Species With Alternate Phyllotaxy:

1. *Plumeria acutifolia* Poir Apocynaceae (Fig. 4)
2. *Cordia subcordata* Linn Boraginaceae (Fig. 2)

Species With Opposite Phyllotaxy:

3. *Nyctanthus arbor-tristis* L Verbenaceae (formerly of Oleaceae vide Kew Bull. No. 2, 1952) (Fig. 5)
4. *Jasminum sambac* Ait. Oleaceae (Fig. 7)
5. *Banisteria laurifolia*—Malpighiaceae (Fig. 3)

Leaflets:

6. *Azadirachta indica*—A. Juss.—Meliaceae (Fig. 6)
7. *Clausena heptaphylla* W. and A. Rutaceae (Fig. 6)

Worsdell (1915) considers this phenomenon as due to a kind of hypertrophy and an attempt on the part of the organ to reproduce itself. He has also stated that forked leaves occur perhaps most commonly in plants with their leaves arranged in an opposite decussate manner. He

carbonate solution extracts only about 50% of magnesium under the best of conditions So Puri's method is not suitable for estimating the degrees of alkalinisation in soils; nor is it satisfactory for the determination of exchangeable magnesium.

In our work on "Cholam Effect" we have had to study the physico-chemical properties of Koilpatti soils. In Koilpatti it has been found over the last 25 years that cotton following Irungu cholam in crop rotation is stunted in growth and the yield of cotton is on the average about 16% lower than when it succeeds cumbu. This harmful effect of Irungu cholam on the succeeding cotton crop is termed "Cholam Effect". The chemical investigation of the phenomenon has been undertaken and the Koilpatti soils are being studied in detail. These are heavy clay soils which crack deeply in summer. They have been formed under semi-arid conditions. There is an abundance of free calcium carbonate (Kankar) in the soil and appreciable amounts of gypsum are also found.

As one of the hypothesis put forward to account for the harmful effect of cholam on the cotton following it, was a rise of sodium in the soil it became necessary for us to estimate the exchangeable sodium by a direct method. There were no satisfactory methods for the estimation of exchangeable bases in a soil containing free calcium carbonate, gypsum and soluble salts. As a result of a large amount of preliminary work the following method was adopted.

Procedure for Calcareous Soils and Alakaline Soils not Containing Gypsum: Ten grammes of the air-dry soil are weighed out into a beaker and stirred with 50 cc. of 40% alcohol adjusted to pH 7·05 with ammonia. It is allowed to stand and the clear supernatant liquid is transferred to a filter. The soil is washed by decantation three times for calcareous soils not containing much of soluble salts especially sulphate in the form of gypsum. The washed soil is leached in the cold with 500 cc. of N/2 ammonium acetate solution adjusted to pH 8·4 with ammonia. The leachate is evaporated to about 100 cc. and calcium is estimated in it as calcium oxalate by the volumetric method.

The filtrate and washings from calcium estimation are evaporated to dryness on a water bath after the addition of about 1 cc. of 1 : 1 sulphuric acid. The residue is ignited to remove ammonium salts and then dissolved in dilute hydrochloric acid and made up to 250 cc. In aliquots of 75 cc. magnesium, sodium and potassium are estimated as magnesium pyrophosphate, triple acetate of sodium uranium and magnesium and potassium platinichloride or cobaltinitrite respectively.

The leached soil is saturated with 10 cc. of N/2 ammonium chloride solution and then washed with 40% alcohol adjusted to pH 7·0

until the washings run free from chloride. The washed ammonium soil is distilled with magnesium oxide and the ammonia liberated is estimated to obtain the base exchange capacity of the soil.

Procedure for calcareous soils containing gypsum: In the case of such soils after washing 3 to 6 times with 40% alcohol 10 gms. of the soil is digested with 20 cc. of saturated barium hydroxide solution stirred vigorously and allowed to stand for half-an-hour with frequent stirring. Carbon dioxide is bubbled through the mixture to precipitate the excess of barium as barium carbonate. The mixture is then heated on a water bath at about 80°c for about 15 minutes. 100cc. of N/2 ammonium acetate adjusted to pH 7·0 are added to the soil and the mixture is allowed to stand at about 60° for half-an-hour. The mixture is filtered and washed by decantation three times with 50cc. portions of N/2 ammonium acetate. The soil is transferred completely to the filter and leached with ammonium acetate untill 500cc. of the leachate are obtained.

The leachate is concentrated to about 100cc. and calcium is precipitated in it is as calcium oxalate. The precipitate is filtered and washed until the washings run free from chloride. The precipitate is rejected. The filtrate and washings are evaporated to dryness with 1cc. of 1 1 sulphuric acid. The residue is ignited to remove ammonium salts and then dissolved in dilute hydrochloric acid. The solution is made up to 250cc. and magnesium, sodium and potassium are estimated each in 75cc. aliquots. These are calculated as milliequivalents per 100 gms. of the soil.

The soil on the filter which has been leached with ammonium acetate is saturated with 10cc. of N/2 ammonium chloride solution. It is then washed with 40% alcohol adjusted to 7·05 with ammonia until the washings run free of chloride. The washed ammonium soil is distilled with magnesium oxide and the ammonia liberated is estimated in the usual method by absorotion in standard sulphuric acid. From the volume of standard sulphuric acid used up the base exchange capacity of the soil can be calculated.

In calcareous soils it may be assumed that the soil is completely base saturated and that no exchangeable hydrogen is present. So if the sum of exchangeable magnesim, sodium and potassium is subtracted from the base exchange capacity the amount of exchangeable calcium is obtained.

Discussion of the method: The first step should consist in the romoval of the free soluble salts present in the soil so that they do not complicate the estimation of the exchangeable bases. Water cannot be used for washing since it brings about changes in the exchange complex of the

soil and since it disperses the soil. However, 40% alcohol adjusted to pH 7·05 serves the purpose. It dissolves out the chlorides, carbonates, bicarbonates and a part of sulphate present in the soil All the sulphate, however, cannot be removed by washing with 40% alcohol. The alcohol does not disperse the soil except when the free electrolytes are washed out. Three washings with 40% alcohol are sufficient in the case of soils not containing much chloride, carbonate etc., : with saline and alkaline soils six to eight washings are required.

Sulphates, especially gypsum which are only slightly soluble in 40% alcohol can be removed from the solution by treatment with barium acetate or barium hydroxide. The excess of barium is thrown out of solution by bubbling carbon dioxide through the mixture. Exchangeable bases are estimated in the treated soils by leaching them with ammonium acetate solution, In the leachate exchangeable magnesium, sodium and potassium are estimated and the sum of these is subtracted from the base exchange capacity to obtain exchangeable calcium.

Acknowledgment: The authors are greatly indebted to Sri P. D. Karunakar, M. Sc , (Rutgers) A. R. I. C., the former Government Agricultural Chemist, Coimbatore (Madras) and to Sri M. Sanyasi Raju, M Sc., (Wisconsin) U. S. A., the Government Agricultural Chemist, for their encouragement and valuable criticism in the course of the work.

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Survey of Hindupur Taluk, Anantapur District with Special Reference to Cultivable Waste Lands

By

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Introduction: Cultivable waste lands constitute one of the most important and potential additional sources of increased food production. In arid tracts like the Ceded Districts they occupy a considerable portion of the land fit for cultivation. A survey to assess the physical, soil and botanical features of waste lands can give an indication of the suitability of these lands for cropping and the possible means of bringing them under cultivation.

With that end in view, an experimtntal survey of Hindupur Taluk in Anantapur District, with special reference to waste land areas, was undertaken by the author in 1946 under the orders of the Director of Agriculture, Madras. The salient features of the taluk as brought out by the survey are presented in this paper.

Physical features of the Taluk: Hindupur is the southernmost and smallest taluk (with an area of about 431 Square Miles) of Anantapur District. It is a continuation of the Mysore Plateaux. It is traversed from north to south by the southern extension of the Penugonda range of Hills, dividing into two approximately equal parts. A similar continuation of Mallappa Konda range forms its eastern boundary. Between these two hill ranges lie a series of undulating uplands. This portion forms the eastern part of the taluk. The western part lying to the west of the central range of hills does not contain so much of undulating upland, and is more favoured by tanks and rivers or streams. The Pennar river runs right across the eastern portion of the eastern part of the taluk.

Climate: The taluk, being a continuation of the Mysore Plateaux enjoys a temperate climate.

The average rainfall is about 23 inches, the most rainy months being August, September and October. The distribution of rainfall is as follows:–

January	0·10″	July	2·37″
February	0·12″	August	2 90″
March	0·15″	September	5·06″
April	0·81″	October	4 29″
May	2·68″	November	2·03″
June	2·22″	December	0 31″

Irrigation sources: The taluk is mostly dependent on rainfall and tanks which get filled up by the rains, while the small rivers are for the most part of the year dry and undependable. The tanks supply water only for about four months of the year. So most of the cultivated area is under dry cultivation, and the small wetland area depends on tanks during part of the year and on wells for the rest of the year.

Crops: This taluk is more favoured by nature than other taluks of the district in the matter of climate and rainfall, and so supports more vegetation and better crops. In wetlands or garden lands ragi, paddy, sugarcane, chillies and jonna are the most important crops. In dry lands, ragi, horsegram, samai, groundnut, korra and redgram are grown.

Wastelands: The taluk contains blocks of wasteland areas (both cultivable and uncultivable areas) in almost all the villages. Uncultivable portions of the wastelands are found more in the eastern part of the taluk which is almost a series of undulating uplands with frequent occurrence of rocks and hills, than in the western part which is more favoured by nature.

1933 figures from the District Gazatteer show the following :–

	Area in acres in the taluk
Forests	24,009
Not available for cultivation ...	36,870
Cultivable waste other than fallow ...	37,924
Current fallow	61,579
Net area cropped	115,535
Total ...	275,917

This shows that about 27 percent of the total area of the taluk was wasteland (cultivable as well as uncultivable waste, excluding forests). Out of this about half or about 14 percent of the total area is cultivable wasteland.

Conditions in the taluk probably continue to be the same and there are vast stretches of wasteland in almost every village of the taluk.

Survey: The taluk was divided into 15 gridsquares. Each gridquare was covered by visits to at least four sampling spots. At every sampling spot details of topography, soil features and vegetation were noted. Village records were also consulted.

Soils: In general, all the wastelands either in the eastern or in the western part of the taluk are dry lands. Almost all the drylands in general and wastelands in particular are red loams and red sandy loams in the western half of the taluk, and gravelly soils for the most part and red

sandy leams in some places in the eastern half of the taluk. The depth of the soil varies from six inches to three feet in the western half of the taluk and from four inches to two feet in the eastern half, with a gravelly subsoil. There are also rocks and stony wastes absolutely unculturable in the eastern part. Water table is about 30 feet deep in most places of the taluk.

Vegetation: In the western part of the taluk in most of the wastelands there is an attempt (mostely successful in years of normal rainfall) to cultivate dryland crops like horsegram, korra and groundnut.

The predominent plants making up the natural flora of this part of the taluk are the following;—

Shrubs: 1. *Cassia auriculata* — in the major part of this area.

2. *Dodonea viscosa* and other scrub jungle type of vegetation along with the western slopes of the central range of hills.

Grasses: Grasses occur more frequently in this part of the taluk than in the other. The more important of the grasses are:—

1. *Aristida funiculata*
2. *Aristida depressa*
3. *Erograstis viscosa*
4. *Dicanthium annulatum*
5. *Aristida hystrix*
6. *Cymbopogon caesius*

Trees :
1. *Acacia arabica*
2. *Pongamia glabra*
3. *Phoenix sylvestris*

The wastelands in the eastern half of the taluk are mostly garvelly and rocky uplands with poor vegetation which is mostly of a scrub jungle type. The following are the more important of the natural flora.

Shrubs and trees:
1. *Dodonea viscosa*
2. *Euphorbia antiquorum*
3. *Plectronia parviflora*
4. *Butea frendosa*
5. *Albizzia amara*
6. *Ixora parviflora*

Grasses :
1. *Aristida funiculata*
2. *Cymbopogon depressa*
3. *Erograstis viscesa*

Conclusions: Most of the wastelands in the western part of the taluk are cultivable. In fact, there is what is called 'Sivaijama' type of

cultivation in many of these lands in years of normal rainfall : the ryets pay some assessment to the Government and cultivate the land without permanently owning the land Dry land crops like horsegram, groundnut, korra and samai can be successfully grown. But the greatest limitation is the poor rainfall which in some years proves disappointing.

The usual sources of irrigation are tanks, wells and spring channels from the beds of rivers. The third source is very limited and the tanks are useful only to lowlying wetlands and are for the most part of the year dry. Wells can serve some portion of the wastelands for gardenland cultivation wherever feasible and for supplementing the scanty rainfall. Digging of deep and big wells can be encouraged from which water can be pumped by oil engines or by electricity, if made available. Another way of bringing more land under irrigation and cultivation is by laying dams across the river Pennar and other streams.

The big block of cultivable wastelands occurring in many places in this part of the taluk can very well be utlised by land colonization schemes. Cropping of the smaller block of the cultivable wastelands adjuscent to villages can be encouraged by substantial subsidies or lones to the neighbouring ryots for the purchase of implements and cattle, digging wells and for other facilities, and by other concessions.

Most of the wastelands of the eastern part of the taluk are gravelly and rocky uplands and are therefore uncultivable. There are pockets of useful areas (for example, near Budili and Palasamudram) which are sandy loams where deep and big wells can be dug and the water pumped by oil engines or electrical motors. Ragi, chillies, jonna and sometimes paddy can be grown in these pockets.

Either in the eastern or in the western part of the taluk, wherever it is not possible for the ryots to grow crops either because of the distance from the village or for other causes, the blocks of wastelands can be best utilised by growing fuel cum fodder trees by the Forest Department or by any other suitable agency.

Acknowledgement: My thanks are due to Sri T. Venkataramana Reddy, Lecturer in Botany, Agricultural College, Bapatla for his valuable guidance in preparing this paper.

Talinum Triangulare, Willd., Family — Portulacaceæ

A little known wonder pot-herb

By

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Towards the end of August 1952 a short note appeared in some of the Madras dailies from the Agricultural Department that the department was propagating and doing propaganda about new kind of spinach, *Talinum triangulare*, reported to be a very useful plant for the kitchen garden, being easily grown in the shade, and that the Director of Agriculture obtained the seeds from Ceylon, that he was growing the plant in his own garden and in some of the departmental farms in about two months It is very interesting to see that Sri Sivaraman, the Director, has always a peculiar knack of tracing out such useful plants and encouraging their distribution to the people This plant is fairly widely found in the West coast and is possibly introducedr into ou country from Ceylon and is generally known as 'Ceylon keerai'. It is also found in the neighbouring district of Coimbatore. Ochse in "Vegetables of the Dutch East Indies", mentions that the plant was introduced into Java from Surinam in 1915. Our contact with Java and Ceylon being from time immemorial, it is very likely that the plant came to India from Java directly or through Ceylon and got into the West coast. However, J C. Willis mentions fifteen species of Talinum distributed in Africa, America and India. The plant is mainly propagated from cuttings and grows very fast. Though Ochse says that it demands a soil rich in humus or heavily manured, it does not seem to be fastidious about any particular soil or locality in this country. It thrives in the sun and the shade, more vigorously in the latter. The herbaceous cuttings from the stem or the top shoots, about two or three inches long, when planted in the soil easily take roots and grow. It is also propagated from seeds, though comparatively slowly, the seeds being squirted about when the fruits dehisce. After the elegant pink petals are dropped the capsules develop rapidly and burst. Hence the fruits are harvested rather early. The seeds are sown in rows and come to harvest in about six weeks Ochse says that this is a favourite vegetable among the European in Java.

Though the departmental note talks of this as a new kind of spinach and is said to be known as *Pasali* in Tamil, unlike the real spinach, *Spinacea olerceæ*, (Fam. Chenopodiaceæ), neither the juice of the plant nor the preparations from the leaves or stems are slimy in consistency. It is reported, however, that slimy nature is seen in

the plants growing in Cochin and Travancore and the plant is, therefore, not much in favour with people there. This is a matter for investigation.

The Plant: A perennial, succulent, non-fibrous, erect shrub, attaining a height of 1 – 1½ feet, very valuable as a green vegetable and a good substitute for Amaranthus with the same taste, flavour and even appearance in the preparations for the table, with the advantage over Amaranthus of being available through all times without any season and added quality of the preparations keeping well for over 24 hours. It is reported to be full of vitamins and as such of great dietary value to invalids and diabetics in need of vitamins.

Root: The tap root grows straight to about six inches in the soil. This and the side roots are tuberous and conical.

Stem: Glabrous, terete, tinged with purple, tender and easily breakable, herbaceous, succulent and branching.

Leaves: Alternate, simple, crowned at the top of the stem, ex-stipulate, decurrent along the petiole, obovate-cuneate, glabrous, green, green, above dull or feebly shining, shining below, fleshly, pinnate, emarginate; veins not prominent.

Flowers: Terminal panicles, peduncle long, trigonous, divided into 2 – 5 racemes; small flowers, purple, bisexual. *Calyx*: 2 sepals, free, green. *Petals*: 5, purple, hypogynous, obovate. *Stamens*: numerous, anthers bilobed. *Overy*: superior, round, one celled; style three – fid; ovules numerous, placentation free, central.

Fruit: Globose, pea-like; capsule three valved, seeds being spurted out during dehiscence; seeds globose, reniform, black and shining granular.

The Gir Breed in Madras State

By

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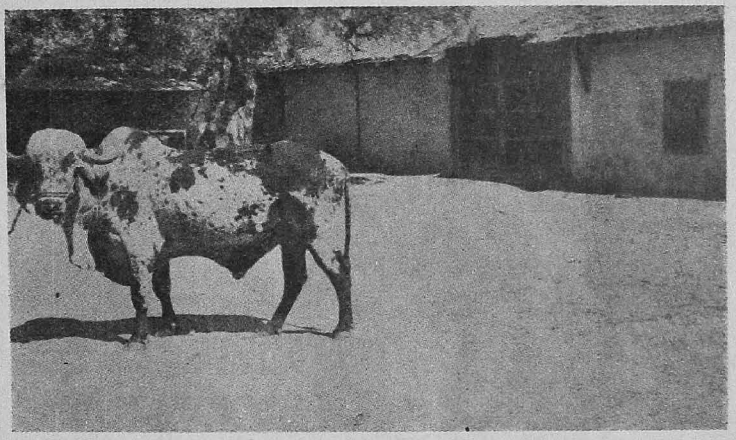
Ever since the division of India the problem of procuring good Scindhi animals from Pakistan became very difficult. While it was essential to preserve the existing Scindhi herd, the question arose whether another milch breed could be found in sufficient numbers from within the Indian Union. At the time the Saurashtra was in the throes



of a severe famine and the then Governor of Madras, His Highness the Maharaja of Bhavnagar, a very keen and practical Animal Husbandry man, suggested a trial of Gir cattle in some parts of Madras State. As the Scindhis were quite successful for the southern and western districts where cattle are small and sometime too small even for Scindhi, it was considered the Gir would be useful for grading up scrub animals of the northern districts outside the Ongole breeding tract where animals are too small for the Ongole bulls and bigger than Scindhis.

With the assistance of Sourasthtra Government officials and His Highness' personal staff, animals were selected with much care but under great difficulties. Thanks are due to His Highness for generously permitting sale at a nominal price some good bulls and female stock from his pedigree herd at Bhavnagar. The original intention was for stationing the new herd at the Dairy cum Bull Farm, Hanumanthawaka, Vizakhapatam but with a view to get animals into condition quickly it was sent to Hosur Cattle Farm where conditions are favourable.

Gir breed has suffered considerably due to depletion on account of slaughter of dry animals after the milk supply at Bombay. This breed has been appreciated in the Americas for producing cross-bred milk animals. In this country, the milking quality of certain breeds particularly Krishna valley cattle has been influenced by the Gir.

Gir animals are of medium size with a well proportioned body, clear cut lines and a robust constitution. The herd at Hosur Cattle Farm has been in the open with very little shelter and they have done quite well. Comparative figures with regard to weight, lactation etc. for the breeds in Madras State are given below :

Breed	Average weight of a				Average lactation yield lbs.
	Matured bull lbs.	Matured cows lbs.	Bull calf at birth lbs.	Heifer calf at birth	
Ongole ..	1,400	900	65	60	2,500
Kangayam ..	1,100	800	46	42	1,500
Hallikar ..	1,200	800	46	43	1,000
Scindhi ..	1,000	750	47	42	4,000
GIR ..	1,200	700	48	43	3,800

The Gir animals are amenable to handling and give a docile appearance. The bullocks are heavy and powerful animals but medium paced. They are extremely used for draught purposes in their home tracts and adjoining States.

The prominent bulging forehead, very large and pendulous ear hanging down with a twist, peculiar downward and backward curve of the horns and varied colour markings are peculiar to the breed. With regard to the colour there is a superstition in the breeding tract that circular or oval and other prominent patches of red, black or even white are due to Lord Krishna having placed his hands on the breed. Out of a total strength of 70 animals in the herd about 60% possess this marking.

However, with the little experience we have had with the breed, colour inheritance is quite interesting. The following observations are made:

1. Bull with red base and white speckled mated with deep red cow throw deep red calves;
2. Bull with dark red base with grey patches all over crossed with red cows gives red calves.
3. Bull with white base and red patches all over crossed with red base cow gives red calves.
4. Bull with white base and grey patches crossed with similar cows with marking has a tendency to throw animals with similar colouring.
5. Bull will white base and white or grey patches mated with cows with similar marking has a tendency to throw animals with similar colouring.

From the point of view of milk it is gratifying to find that in the Gir we have great potentialities as a Dairy animal. The following comparative figures are interesting despite the fact the numbers involved are small.

	Gir	Schindi	Ongole	Remarks
Average Length of lactation ..	277 days	307 days	277 days	At Hosur
Dry period ..	87 ,,	176 ,,	147 ,,	64·3% of Gir
Average milk yield ..	3,800 lbs.	4,000 lbs.	2,500 lbs.	herd remained in milk
Highest milk yield ..	6,000 ,,	11,000 ,,	6,800 ,,	throughout
Dairy average during lactation ..	13·9	12·9	9	1951—1952

It will be seen that the average milk production is quite high. The dry period being short the breed is ideal from the milk production point of view.

The quality of milk itself is good giving average of 4·5% butter fat. For butter making, however, the flavour of butter is second to the Scindhi but in carotene content from visual observation the depth of colour is similar. From the point of keeping qualities, Gir butter kept the longest compared with Scindhi and Kangayam.

A small herd of Gir has been stationed at the Dt. Livestock Farm, Koila, South Kanara District where there is very high rainfall. Though they appear to be doing well under farm conditions, the bulls are too big for the local cows for extensive use of Gir bulls.

There have been a few calves born to Gir bulls distributed from Hosur Cattle Farm and there are private owned animals in areas bordering Bombay State. So far the progeny seem to indicate that there is great promise for upgrading the scrub cattle in the areas where the animals are medium sized and which are too small for Ongoles and too big for Scindhis.

Thanks are due to Sri K. Kandasamy Raju, Superintendent, Kangayam Cattle Improvement Scheme, Palayakottai at present, Dr. G. Venkatachalam, Superintendent, L. R. S. Hosur Cattle Farm and Dr. P. Viswanathan, Dt. Veterinary Officer (Milk Supply), Madras at present for collecting the data under my guidance.

Agricultural folk lore in Malabar

By

C. BALASUBRAMANIAN,
(Agricultural Meteorologist, Coimbatore)
and
R. GOPALAKRISANAN,
(Assistant in Meteorology, Pattambi)

Introduction: Folk lore is the expression of accumulated experience in the form of songs, sayings and proverbs. It is current in many countries and in many languages. Often folk lore gives valuable information. Folk lore relating to weather and agricultural practices, obtaining in Malabar is full of interest, with wealth of details. The gist of information from a few selected sayings in the local language is given under different heads to show how they are of interest and guidance to the farmers.

Seeds: 1. Use good pedigree seed and you get a bumper yield.

2. If you have seeds ready, you can cultivate at proper season.

3. The less the quantity of seed the more the number of ploughings required.

4. Yield can be forecasted from the vigour of germination.

Cultivation: 1. Close attention will improve both land and lass.

2. Ten ploughings for dry showings.

3. Labour charges will be twice the seed.

4. Though work is not equally turned out, the sunlight must be equally shared – meaning though the farmer is not working along with the labourers, atleast he must be with them supervising the work.

Sowing and Planting: 1. Early crop means golden crop.

2. If the seed is sown deep the granary will get filled up.

3. The earlier the seeds are sown the better filled will be the earheads.

4. Give a wider spacing for big bunches of seedlings (Paddy) during transplanting the first crop.

Manuring: 1. Owner's supervision means the best manure.

2. "Like manuring at the ear heads!"

3. Fish manure for vegetables and pit manure for paddy lands.

Irrigation: 1. Irrigate at the base and the sprouts will come at the top.

2. Frogs must jump under bitter gourd vines.

Harvest and Yield: 1. Ten days in shot blade, ten days in flower, ten days in milk and ten days for ripening (paddy).

2. The third year will take pepper to the grinding stone and the fourth year to the town.

3. The low lying lands will give heavy yields.

4. If you dry coconuts too much there will be more of oilcake; if you dry gingelly too much there will be more of oil.

Pests and Diseases: 1. If there are no rats, no pigs, no bandicoots and birds cultivation will be more paying.

2. If sowing is done in "Puyyam nattuvela" there will be insect trouble afterwards.

3. If there is heavy rain in 'Karthiga Nattuvela'* the seedlings succumb to insect pest specially army worm (Spodoptera mauritia) for paddy.

4. If there are long spells of bright weather in 'Makeeram' and 'Tiruvathera' nattuvelas, there will be attack by silver shoot (Pachydiplosis oryzae), and leaf beetles (Hispa and Leptispa) for paddy.

5. Strong winds during 'Moolam' and 'Pooradam' nattuvelas will reduce the incidence of Rice bug (Leptacorisa acuta)

Cattle: 1. Farming without cattle and a girl without eyes are equally bad.

2. Small, short and smart are the qualities of the working animal.

3. If you pay silver for purchasing cattle you must pay gold, for getting a fellow to look after it.

4. Give a heavy plough for a falling bullock.

5. Lightning in the month of Karkkidekam (July) is bad for the working animal.

6. A white bullock which has give parts black is good at work (the give parts are eyes, muzzle, horns, hoofs and tuft of the tail).

7. Horns farther apart, hoof cleft close, dewlap small, sheath and scrotum not at all pendulous and tail short are the signs of a bullock which does not require a whip to drive him.

Rains and Crops: (a) *Paddy:* (i) Rains in the month of Kumbham, augurs well for the next crop.

(ii) Sowing in 'Bharani' nattuvela, by timely rains, ensures good yield of first crop.

(iii) Incessant rains in 'Thiruvathera' nattuvela will make even stones to strike roots.

(b) *Coconut:* Rains in the month of 'Thulam' (North East Monsoon) is most important for good bearing.

(c) *Pepper:* Failure of rains in 'Thiruvathera' nattuvela, will result in poor yields of crops, especially pepper. The rains during this period count a lot for proper setting of the berries.

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*Nattuvela — The Agricultural year commences from the first of the Malayalam month 'Medam' (April 15th) and the whole year is divided into twenty seven periods of nearly two weeks each, called a 'Nattuvela'. These nattuvelas are named in sequence from the first star 'Aswathi' and so on of the Zodiac.

(d) *Ginger:* (i) Plant ginger during the month of 'Edavom'.

(ii) Rains during the month of 'Chingom' are essential for good yield.

(e) *Gingelly:* (i) Seeds should be sown in the beginning of 'Makkeeram' nattuvela.

(ii) Heavy rains in the months of 'Dhanu' and 'Makaram' work adversely.

(f) *Horsegram:* (i) Rains in the month of 'Makaram' will spoil the crop.

(ii) Three rains for horsegram.

General observations on weather: 1. The sun setting behind a cloud forebodes rain the next day.

2. Two full moons in a calendar month bring in a flood.

3. The rainfall in different nattuvelas is directly proportional to the velocity of wind on each star day of the month of 'Kumbam'.

4. Rain before seven Fine before eleven.

5. Rainbow after a long drought is the precursor of a decided change to wet weather.

6. Thunder rains accelerate the growth of mushroom.

Animals and plants as prophets: 1. If oxen turn up their nostrils and sniff in the air, if they lick their forefeet or lie on the right side, it will rain.

2. If bats cry much or fly into the house, it will rain.

3. If the rain birds cry, there will be rain on that day.

4. Cranes flying towards the source of a river indicate rain.

5. Fish swim upstream before rain.

6. If the snails and slugs come about abundantly, it is a sign of rain.

7. If ants are more than ordinarily active, or if they remove their eggs from small hills, it will surely rain.

8. Profuse flowering of the following plants is said to indicate high yields of certain crops as noted below :—

Ficus religiosa (peepal)	— Prosperity for all plants.
Zizigium jambolana (Naval tree)	— High yields of gingelly and black gram.
Bassia latifolia (Euluppai)	— Good yields in wheat.
Pterocarpus marsupium (Vengai)	— Mustard.
Pongamia glabra (Pungam)	— Greengram.
Bamboosa indica (Bamboo)	— An year of pestilence.

Conculsion: Agricultural folk lore can often guide the farmer in his agricultural operations. It offers wide field for the Meteorologists and Agronomists to scientifically interpret the 'Nattuvelas' in their relationship to cropping practice.

Acknowledgment: The authors are highly greatful to Sri M. B. Venkatanarsinga Rao, Paddy Specialist, Coimbatore for his guidance in the preparation of this note. Their grateful thanks are due to the Assistant Paddy Specialist, Agricultural Research Station, (past and present) and to the executive staff stationed at Pattambi for the valuable help rendered in the collection of data.

Thoughts After the Tour

By

C. K. K. PANIKKAR
Final Year B. Sc. (Ag.)

Study tours and excursion trips are better than class room broadcasts. The emotional awareness to facts of reality enriches experience very much as a panorma of events on the silver screen. The students of the final year returning recently after the tour could feel with Wordsworth :

> "To the solid ground of Nature trusts the mind
> That builds for age."

To see places of importance is itself a great opportunity. Then again we learnt a lot as outgoing students of the Agricultural College, Coimbatore. The achievements in Agricultural Science at the Research Institute could be compared with that of the various Research Stations we visited. The insight and inspiration into the progress of research did make us feel proud of our achievements in the comity of nations.

Before this tour we were under the impression that weaning of calves is harmful to the proper growth and development of the young stock. But we were impressed by the results at the Military Dairy Farm at Hebbal and the Indian Dairy Institute at Bangalore. The progress achieved by hand feeding proper adjustment was quite marked. The only point of importance is the need to maintain scrupulous cleanliness all

round and adopting scientific care in feeding and rearing the calves. The betterment of our livestock and Dairy Industry is dependent on this prime factor.

The volume of work done at the Dairy Institute is outstanding. They have practically completed the whole analysis of the Vitamin (B) Complex in milk. It is stated that goats' milk is superior to all other milks. One could see the preference and particularity of the Father of the Nation for the goat's milk.

The experiment on milch cows is again interesting. These cows are made to work in the field and are given 2 lb. of additional concentrates with a basic ration of 1 lb. for every 2½ lb. milk production. The results show that some of them give increased milk yields. This is of special interest to us because cows can also be put to work without loss of milk. Humanity itself, keen on fundamental rights, can take a lesson that irrespective of caste or sex, all can work fostering the food cycle to gather more food.

We saw the students of the Hebbal Agricultural Collage working earnestly in the fields like actual mazdoors. We could hardly believe our eyes or forget our experience at Coimbatore. We learnt later that they are permitted to enjoy the produce got from their plot cultivation, free of cost, as the fruit of their bodily labour. This practical policy of the Mysore Government can also be adopted by the Madras State to make better farmers and better farming possible.

Our visit to Tanjore, the granary of the south is a memorable event. The brilliant achievements of the scientist-cum-administrator Sri. K. Ramaswamy, Superintendent, Agricultural Resarch Station, Aduthurai are of epoch making importance in the history of Indian Agriculture. The economic method of rising green manure crops for higher rice production and cotton cultivation are not small achievements in the most conservative stronghold of South India. The feasibility of growing cotton after a paddy crop is a real boon to the delta ryots and the Agricultural Department has made successful demonstrations in this direction. Pillipesera and some other suitable fodder crops with the available plentiful supply of paddy straw will open a new line in the field of agro-industrial development like dairying. This rich rice district can produc more and more of rice and cotton and dairy produce to meet our immediate future requirements. This endeavour not only results in the betterment of the people of the locality besides reducing the food and clothing deficit of the State which may become more acute after the separation of the Andhra State.

The picturesque live fence of Commiphora Caodata at Malliam impressed the students as a suitable hedge plant for orchards, equally well appreciated by the mirasdars.

The specialists at the Poultry Research Stations alone made the students critical of the contradictory conclusions arrived at by the different stations. This seems inevitable under the present circumstances where specilisation leads one to know more and more about less and less in the words of the humourist. But this will not happen with an all round and comprehensive collaboration of research workers with the practical farmers of the land to inaugurate a new era in agriculture where students also have an intelligent role to play with their minds receptive to progressive ideas on practical problems

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Research Note

A Note on the Propagation of Rattan Cane (*Calamus Rotang*, Linn.)

By

SRI T. GOPALAN NAIR
Banana Research Officer, Aduthurai

The genus Calamus is mostly tropical. There are about thirty species, comprising mainly, *Calamus rotang*, Linn, *Calamus latifolius* Roxb., *Calamus andamanicus*, Kurz., *Calamus guruba*, Buch. and *Calamus acanthaspathus*, Griff. They are distributed in Assam, Andamans, Malabar, Coorg, Travancore and Ceylon. *Calamus rotang* is of economic importance due to the erect cane the plant produces in about five years. This plant grows wild on the sides of the Coleroon river in the Shiyali taluk of Tanjore district and in this locality there is an established cottage industry for the manufacture of the well known designs of attractive furniture and boxes by making use of this cane.

A trial on the propagation of this cane was done at the Central Banana Research Station, Aduthurai during 1951 and the results are given below :–

The planting materials, cutting of root suckers and seeds were collected from the banks of the Coleroon river. After the cutting of the canes with its whip like thorny leaves, the root suckers are excavated.

Weather Review — For January 1953

RAINFALL DATA

Division	Station	Total rainfall for the month	Departure fromnormal in inches	Total since 1st January in inches	Division	Station	Total rainfall for the month	Departure fromnormal in inches	Total since 1st January in inches
Orissa & Circars	Gopalpur	2·1	+1·8	2·1	Central Contd.	Vellore	0·1	— 1·4	0·1
	Calingapatnam	1·1	+1·9	1·1		Gudiyatham*	0·0	— 0·6	0·0
	Visakhapatnam	2·1	+1·7	2·1		Salem	£	— 0·3	£
	Arakuvalley*	0·1	—£@	0·1		Coimbatore (A. M. O.)*	0·1	— 0·2	0·1
	Anakapalle*	0·13	+0·1	0·3		Coimbatore	0 1	— 0·5	0·1
	Samalkot*	0·3	+0·2	0·3		Tiruchirappalli	0·5	— 0·3	0·5
	Kakinada	0·1	—0·2	0·1					
	Maruteru*	£	—	£	South	Nagapattinam	3·6	+ 0·9	3·6
	Masulipatnam	£	—0·2	£		Aduturai*	1·2	— 1·0	1·2
	Guntur*	0·0	..	0·0		Pattukottai*	1·4	— 0·2	1·4
	Agrl. College, Bapatla*	0·0	—0·1	0·0		Mathurai	0·1	— 0·7	0·1
						Pamban	0·6	— 2·0	0·6
	Agrl. College, Farm, Bapatla*	0·0	X	0·0		Koilpatti*	0·1	— 0·8	0·1
						Palayamcottai	1·7	— 0·0	1·7
	Rentachintala	0·1	+0·1	0·1		Ambasamudram*	1·5	— 1·7	1·5
Ceded Districts	Kurnool	0·0	—0·2	0·0	West Coast	Trivandrum	0·4	— 0·4	0·4
	Nandyal*	0·0	0·0	0·0		Fort Cochin	0·0	— 0·9	0·0
	Hagari*	0 0	—0·1	0 0		Kozhikode	0·0	— 0·2	0·0
	Siruguppa*	0·0	—	0·0		Pattambi*	0·0	— 0·2	0·0
	Bellary	0·0	—0·1	0 0		Taliparamba*	0·0	— 0·1	0·0
	Cuddapah	0·0	—0·4	0·0		Wynaad*	0·9	+ 0·4	0 9
	Kodur*	0·1	—0·7	0·1		Nileshwar*	0·0	— 0·3	0·0
	Anantapur	0·0	—0·2	0·0		Pillicode*	0·0	— 0·4	0·0
						Mangalore	0·0	— 0·3	0·0
Carnatic	Nellore	0·1	—1·2	0·1		Kankanady*	£	— 0·3	£
	Buchireddipalem*	0·1	—0·2	0·1	Mysore & Coorg	Chitaldrug	0·0	— 0·3	0·0
	Madras (Meenambakkum)	1·2	—0·2	1·2		Bangalore	0·0	— 0·2	0·0
						Mysore	0·0	— 0·1	0·0
						Mercara	0·0	— 0 2	0·0
	Tirurkuppam*	0·3	—1·4	0·3	Hills	Kodaikanal	0·9	— 2·3	0·9
	Palur*	0·8	—1·5	0·8		Coonoor*	5·7	+ 0·7	5·7
	Tindivanam*	0·5	—1·1	0·5		Ootacamund*	0·2	— 0·8	0·2
	Cuddalore	1·4	—1·0	1·4		Nanjanad*	0·1	— 0·6	0·1
Central	Arogyravaram (Chittoor dt.)	0·1	—0·5	0·1					

Note :—

1. * Meteorological Stations of the Madras Agricultural Department.
2. @ Average of eight years data for Arakuvalley is given as normal.
3. Average of ten years' data is taken as normal.
4. X The Farm was started only in 1951.
5. £ Rainfall 1 to 4 cents.

Weather Review for January, 1953

The seasonal anticyclonic circulation prevailed over the central parts of India from the commencement of the month. A shallow low pressure wave was moving westwards across the extreme South of the country on 7—1—1953, causing a few light showers in Tamil Nad. The low pressure wave persisted for two more days and became unimportant. There had been fairly widespread showers in Tamil Nad on 9—1—1953. Dry continental northerly air extended upto 20 N. on 17—1—1953 and penetrated further South over the Peninsula on 24—1—1953. A feeble cyclonic circulation was moving westwards over the Comorin area on 24—1—1953. A well marked low pressure wave moved westwards across the extreme south Bay of Bengal on 25—1—1953. Another low pressure wave was moving westwards across the South Andaman Sea on 26—1—1953. This became well marked and concentrated into a depression centred at 08 30 hours I. S. T. on 28—1—1953 near Lat. 9°N., Long. 93 E., moved northwards and crossed the Burma coast on 31—1—1953. Dry weather prevailed over the State in general. Day temperatures were generally above normal except during the last week of January, 1953. A series of nine western disturbances with their associated secondaries passed through the extreme north of India in succession during the month.

The noteworthy rainfalls and the zonal rainfall for the month are furnished hereunder:

Noteworthy Rainfalls for the Month

S. No.	Date	Place	Rainfall for the past 24 hrs.
1	8—1—1953	Nagapattinam	2·0″
2	18—1—1953	Coonoor	3·75″
3	19—1—1953	Visakhapatnam	1·5″
4	25—1—1953	Trivandrum	1·3″

Zonal Rainfall

S. No.	Name of Zone.	Average for the month	Departure from normal	Remarks
1	Orissa and Circars	0·52″	+ 0·36″	Above normal
2	Ceded Districts	0·01″	— 0·19″	Just below normal
3	Carnatic	0·63″	— 0·94″	Below normal
4	Central	0·15″	— 0·54″	Below normal
5	South	1·28″	— 0·70″	Below normal
6	West Coast	0·13″	— 0·35″	Below normal
7	Mysore and Coorg	0·00	— 0·20″	Just below normal
8	Hills	1·73″	— 0·75″	Below normal

Agricultural Meteorology Section,
Lawley Road Post, Coimbatore,
Dated: 12th February, 1953.

M. B. V. N., C. B. M. and M. V. J.

Departmental Notifications

GAZETTED SERVICE

Postings and Transfers

Name of Officer	From	To
Sri Francis T. S.	Dy. Director of Agriculture, Visakhapatnam	Dy. Director of Agriculture, Madura
,, Mohammed Ali, A.	Dy. Director of Agriculture, Madura	Dy. Director of Agriculture, Visakhapatnam
,, Seshadri C. R.	Oilseeds Specialist, Coimbatore	Asst. Oilseeds Specialist, Coimbatore
,, Satagopan V.	Dy. Director of Agriculture (Crop Sampling), Madras	State Marketing Officer, Madras
,, Janab Varisai Muhammad S.	Asst. Oilseeds Specialist, Coimbatore	Asst. in Oilseeds, Coimbatore
,, Venkataraman S. N.	State Marketing Officer, Madras	Headquarters Dy. Director of Agriculture (Inspection) Madras
,, Venkatanarayana G.	Oilseeds Specialist, Coimbatore (on leave)	Oilseeds Specialist, Coimbatore

LEAVE

Name of Officer	From	To
Sri Ananthapadamanabha Pillai	District Agricultural Officer, Mangalore	Leave on average pay for 34 days
,, Chidamabaram G. K.	Inspector of Fertilizers, Madras	Leave granted for 4 months.
,, Venkaba Rao M.	Asst. Cotton Specialist, Nandyal	Leave granted for 2 months

SUBORDINATE SERVICE

Postings and Transfers

Name of Officer	From	To
Sri Ananthanarayanan K. K.	A. D., Ponnani,	Farm Manager, Wynaad
,, Appa Rao V.	P. P. A., (Myco) Eluru	Adl. A. D., Eluru
,, Balasubramaniam H.	Storage Asst. Civil Supplies, Nilgiris	Adl. A. D., Vellore
,, Bapayya D.	Farm Manager, Bapatla	A. D., Gannavaram
,, Balagurunathan S.	Fruit Asst. Thimmapuram	Cotton Asst. Lam, Guntur

Name of Officer	From	To
Sri Chacko C. I.	Farm Manager, Live Stock Station, Bhimanad	A. D., Ponnani
,, Habibullah K. S.	A. D. Srikakulam	A. D. Parvatipur
,, Jagannadha Rao	P. P. A. Bellary	Adl. A. D. Bellary
,, Krishniah Patrudu	Adl. A. D. Ambur	Soil Conservation Asst. Vayalpad
,, Krishnamurthy N.	Field Asst. Nannilam	A. D. Gingee
,, Kamalakara Rao M. A.	Marketing Asst. Cuddapah	Addl. A. D. Kurnool
,, Kuruvilla M. J.	P. P. A. (Myco) Shoranur	Potato Asst. Nanjanad
,, Narasimhalu K.	A. D. Tiruvellore (on leave)	Asst. in Chemistry Coimbatore
,, Narayana Nambiar P. A.	Farm Manager, Taliparamba	Farm Manager, Live Stock Station, Bhimand
,, Raman K. R.	Farm Manager, Wynaad	Fruit Asst. Orchard Cum Nurseries Thimmapuram, Salem Dt.
,, Rajagopalan K.	Spl. A. D. Madura (on leave)	Coconut Nursery Asst. Tindivanam
,, Ramanjaneyulu S.	Marketing Asst. Hyderabad	P. P. A. (Myco) Eluru
,, Rama Rao C. H.	Storage Asst. Eluru	A. D. Chintapudi W. Godavari Dt.
,, Rajagopalan M.	Field Asst. Papanasam	A. D. Virdachalam
,, Raghavelu G. V.	Marketing Asst. Hyderabad	Marketing Asst. Cuddapah
,, Srirama Rao P.	Chemical Asst. Coimbatore	Field Asst. Nannilam
,, Subba Rao V. V.	Field Asst. Mannargudi (on leave)	Asst. in Chemistry Coimbatore
,, Suryanarayana B. V.	A. D. Chintalapudi	Cotton Asst. Siruguppa
,, Sobhanadri M. N.	Marketing Asst. Hyderabad	Spl. A. D. (Cotton) Ongole
,, Suryanarayana Sastri	Marketing Asst. Hyderabad	A. D. Cuddapah
,, Subramaniam R.	A. D. Virdhachalam (on leave)	A. D. Puthur
,, Sivasubramaniam T.	Farm Manager (Sugarcane) Sugarcane Liaison Farm Nellikuppam	Technical Asst. Madras
,, Sivasankaran Nair,	Asst. in Chemistry Malt Factory, Coimbatore	Asst. in Chemistry Coimbatore

Name of Officer	From	To
Sri Subba Rao P.	A. D. Gannavaram	Farm Manager, Bapatla
,, Syed Sheriff	A. D. Mudukaluthur (on leave)	Addl. A. D. Tiruvellore
,, Srinivasachar B.	Soil Conservation Asst. Vayalpad	Soil Conservation Asst. Dharapuram
,, Venkataramana Rao V. G.	Technial Asst. Madras	P. A. to D. A. O. Guindy
,, Venkayya N.	Marketing Asst. Hyderabad	A. D. Srikakulam
,, Vittal T. M.	A. D. Gingee	Farm Manager, Sugarcane Liaison Farm, Nellikuppam
,, Umamaheswara Rao P.	Adl. A. D. Eluru	Asst. in Mycology Coimbatore
Janab Md. Waizullah	Asst. in Chemistry Coimbatore	Field Asst. Mannargudy

LEAVE

Name of Officer	From	To
Sri Gopalakrishna Sarma M. V.	Farm Manager, Bapatla	Earned leave for 35 days from 10—2—1953 to 16—3—1953
,, Krishnamurthy R.	Asst. Inspr. of Fertilizers Cuddapah	Earned leave for 60 days from 20—1—1953 to 23—3—1953.
,, Narayana Iyer N.	P. A. to D. A. O. Guindy	Granted leave on average pay for 2 months
,, Phillips P. K.	Addl. A. D. Saidapet	Extra-ordinary leave for one month from 21—1—'53 to 20—2—1953
,, Ramalingam G.	Asst. Inspr. of Fertilizers, Guntur	Earned leave for 75 days from 21—1—1953 to 4—4—1953
,, Ramarathnam W. S.	Asst. Inspr. of Fertilizers, Madras	Earned leave for 90 days from 15—1—1953 to 14—4—1953
,, Raghunatha Rao N.	A. D. Kakinada	Earned leave for 45 days
,, Ramachandran M.	Marketing Asst. Coimbatore	Earned leave for one month
,, Thandavarayan K.	Asst. in Oilseeds, Coimbatore	Granted earned leave for 60 days