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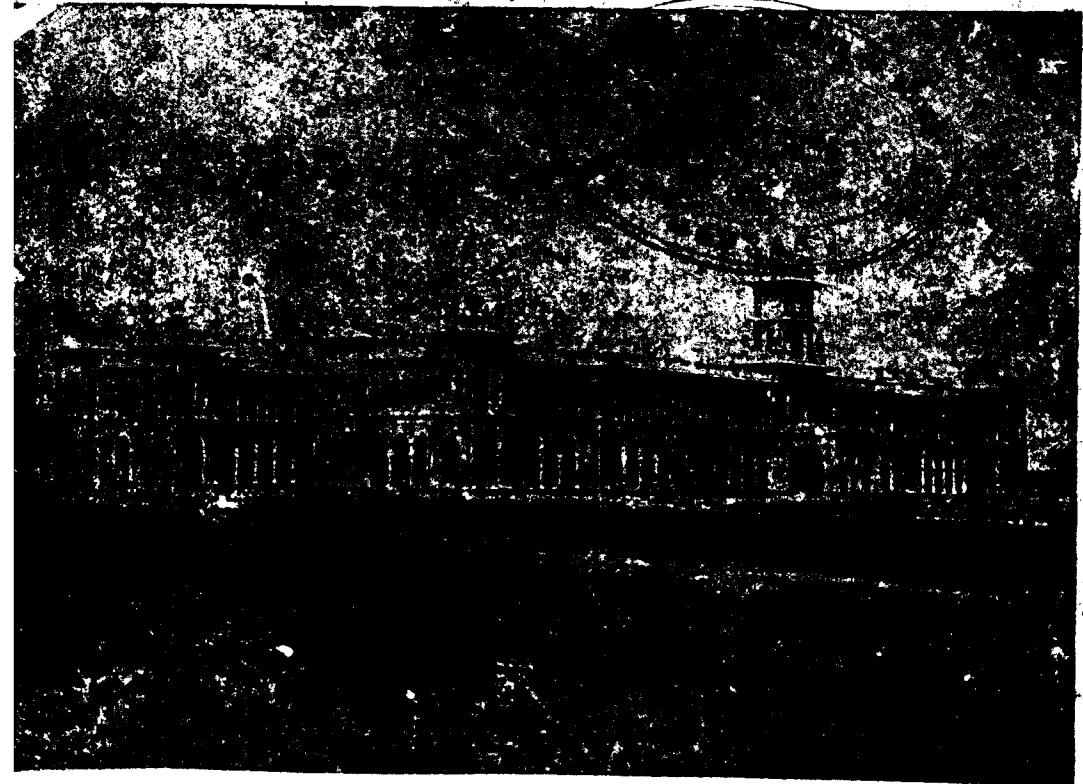
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Editorial

Kwashiorkor — What it means to South India. This is a grand word — fit to rank with Excalibur, Hekatompylos, and Kilimanjaro — in its exotic flavour and air of mystery. And no doubt it will be grabbed up by examiners of All-India competitive services, as well as by radio quiz programmes. The word belongs to one of the Gold Coast languages and refers to the physiological state of the first child, when a second is expected. In recent years it has gained a wide currency by usage to denote the manifestations of protein malnutrition, otherwise known as the syndrome of infantile multiple deficiency, — ("Sindrome Policarencial Infantil). Since it is obviously difficult to draw any real distinction between malnutrition and under-nourishment, the word serves to signify the whole concept of inter-relations between under-nourishment in children of the poorer classes, their malnutrition and deficiencies of both calories and nutrients and the various physical and psychological disorders arising therefrom. Our readers will find elsewhere in this issue a review of the recent F. A. O. publication on this subject based upon surveys carried out in Central America. This is a valuable record which is sure to give plenty of material for serious reflection. It needs no mention that all such deficiency disorders arise primarily from poverty and as India is not very much better than Central American countries in regard to poverty and standard of living, the present F. A. O. publication is bound to be extremely helpful to Indian readers as well. In fact, most of the findings reported in this survey could as well have been collected from many parts of India and the suggestions made for prevention of such malnutrition disorders are eminently practical ones, and are as applicable

to Indian conditions as to the Central American States. These include: (1) "increased production of food-stuffs in general, but especially of those rich in protein (milk, eggs, fish or meat and vegetables.) (2) education of the public in nutrition, to bring about a better utilisation of available food resources and to encourage the use of certain protein-rich foods seldom or never eaten and (3) publicize health and hygiene measures, to combat the secondary causes which precipitate or aggravate the symptoms.

It would be seen that in all these, the foundation is in increased production of the right type of foodstuffs. Herein lies the need to assign top priorities to all those programmes that envisage the improvement of pastures, fodder grasses and legumes, in order to improve milk production, as well as to increase both in quantity and quality, the production of protein-rich food crops like the major pulse-crops and groundnut.

It is to be hoped that similar nutritional surveys would be taken up under the auspices of the F. A. O. or even independently, in the different regions of the Indian sub-continent in the not very distant future.

A Note on the Unusual Occurrence of the Mango Leaf-weevil (*Rhynchaenus mangiferae*, Mshll:), at Coimbatore

by

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AND

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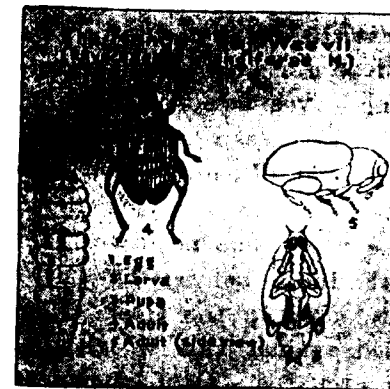
Agricultural College & Research Institute, Coimbatore

Introduction: Three kinds of weevils are known to cause damage to the leaves of mango in South India. They are *Apoderus tranquebaricus*, F. *Eugnamptus marginatus*, Pasc. and *Rhynchaenus mangiferae*, M. The weevil *Rhynchaenus mangiferae*, M. is the smallest among them and is a leaf miner. It was first recorded in India by Fletcher (1914) as the Mango leaf-boring weevil and was subsequently described by Marshall (1915) as a new species *Rhynchaenus (Orchestes) mangiferae*. It is said to be widely distributed in South India. It is recorded only as a minor pest of mango in South India and since the first description of this weevil, there is no record of its occurrence as a serious pest in any locality in South India. The writers noted this year an unusual appearance of this weevil in large numbers in a pest form at Coimbatore during February and March, 1955, on some of the varieties of mango trees at the orchard attached to the Agricultural College & Research Institute, Coimbatore. Severe damage was caused to the foliage of the trees. The varieties attacked are Malgoa, Ammini and Banganapalle. This is the first time the weevil was noted in such large numbers in a pest form in this locality. The sudden appearance of this weevil in such large numbers offered a good opportunity to make studies on the habits of the weevil and try some of the new chemicals towards its control. Observations made on the above aspects are summarised below:—

The weevil, its life-history and habits: The adult weevil is a small, pale, reddish-brown beetle measuring about 2 mm. in length, 1 mm. in width, with darker-brown elytra and a short snout. The most characteristic feature of this weevil is the presence of enlarged posterior legs resembling those of flea-beetles. The weevil has a peculiar habit of jumping like flea-beetles and hence it is also known as 'flea weevil'. When occurring in small numbers they can be seen here and there on the young leaves as small, dark

spots, but during a serious outbreak the weevils may be seen clustering thickly on the tender leaves at the rate of 20 to 30 on every leaf and when disturbed they jump rapidly in all directions to escape capture. The female weevil excavates a small longitudinal pocket in the leaf tissue and into this she inserts an egg. The eggs are laid generally on the underside of the leaves. The eggs are whitish, elliptical and rounded at both ends measuring on an average 0.45 m.m. in length and 0.24 m.m. in width. The eggs hatch in about three days. The newly hatched grubs are very small, pale yellow in colour with slightly flattened bodies tapering to a blunt point at the hinder end and with small brown heads and jaws especially adapted for their mining habits. On hatching they start mining in between the two leaf surfaces making irregular, twisted galleries, and become full-grown in 4 to 5 days. The full-grown larva is about 2.4 m.m. long, pale yellow with flattened bodies. Pupation takes place inside the leaf itself. Before pupation the full grown larva makes a small, oval pupal cell at the end of larval burrow, lining it with a delicate, loosely-woven brownish cocoon and changes into pupa inside this cocoon. The pupae are small and measure on an average 2.0 mm. in length and 1.1 mm. in width. They are whitish at first, gradually turning brownish before the weevils emerge. The pupal stage lasts for about 3 to 4 days, and the weevils after emerging inside their cocoons bore their way out and start feeding within a short time. The total life-cycle lasts for about 10 to 12 days.

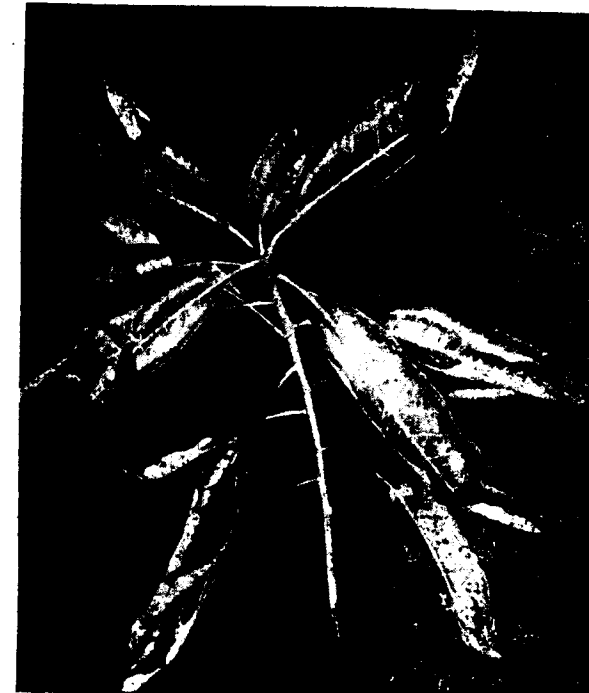
Nature of injury done: The weevil causes damage in adult as well as in its larval stage. The adults feed on the young foliage by eating away small portions of the epidermis and leaf tissues, the injured areas drying up and turning brown so that the leaves sometimes become badly spotted and then curled up or distorted. They usually start feeding at the tip of a leaf and gradually work up towards the stalk sometimes depriving the leaves entirely of all green tissue until these resemble parchment. The larvae mine into the leaves at first, making narrow, irregular, twisted galleries which widen later in blotches. In a minor attack there may be only one or two reddish-brown blotches on a leaf usually near the edge, but during heavy infestation the leaves are almost entirely covered with blotches, a medium-size leaf accomodating up to 20 to 30 larvae. In such cases the whole leaf turns brown and eventually shrivels up. In serious cases considerable damage is done to the foliage of mango trees by this weevil. The drying up of part of



The Weevil and its stages.



1. Leaf showing the damage by the adult weevil.
2. Leaves showing the damage by the grubs.



Mango leaves showing the tips damaged by the adult weevils.

whole of the leaves in affected twigs is so characteristic that a trained eye can spot out an affected tree even from a distance.

Control measures: Fletcher in his notes on the habits of this weevil does not mention control measures. Hutson & Alwis (1934) from their experience in Ceylon says that the weevil occurs in a pest form there and recommend spraying lead arsenate at the rate of 1 oz. to 2 gallons of water on the young leaves as soon as the first indications of an attack are noticed. In cases where the attack has already developed, they suggest removal of all badly mined leaves and burning them to kill all the stages and then spraying the tree to prevent further attack. Since the weevil has not occurred in a pest form in any locality in South India before, there is no information on the control measures adopted for this. Hence some of the new chemicals were tried against this weevil in the recent severe outbreak in the college orchards. DDT 5% plus 50% Sulphur dust, sprays of Lindane and DDT at 0.1% concentrations were tried on selected trees where there was severe infestation. Sprays of both Lindane and DDT were found better than dusts. They had a remarkable effect on the adults, causing 98% kill in 48 hours. The chemicals were also found effective on grubs inside the leaf tissue, causing 50 to 60% kill. Observations after one week of treatment showed that the trees sprayed with these chemicals were completely free from adult weevils. Between the two treatments Lindane and DDT, the latter is to be preferred, as the spraying with DDT now being widely adopted for control of mango hopper, easily destroys this weevil pest also. The cost of spraying a medium-sized tree with DDT worked out only to four annas.

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Crop Rotation Studies on Potatoes

by

M. D. AZARIAH & K. SAPTHARISHI
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No systematic or definite crop rotation is practised by potato growers on the Nilgiris. In pre-war years, when the area under potatoes was limited, only one potato crop used to be taken from the same land once in three or four years. During wartime, increased demand resulted in soaring prices and an extension of the cultivated area, and it was a common sight to come across the same land growing potatoes every year. The present practice, however, is a two-year rotation, consisting of a crop of potatoes in the first year, followed by a grain crop like *samai*, barley, wheat or *ragi* in the second year.

In the United Kingdom, potatoes are chiefly grown either after a grain crop, usually oats, or alternated with a mixed crop of forage grasses and clovers. In districts growing early potatoes, where suitable soil and other conditions are limited for growing other crops, two or more potato crops are however grown in succession. It is on record that on some fields, potatoes have been successively grown for 30, 40 or even more years. Such intensive cropping is not desirable, since there is always the risk of encouraging serious pests of potato like eelworms and diseases like Powdery Scab or Wart disease.

The practice in America is to grow potatoes followed by corn, barley or lucerne in two-year rotations, but here too, the temptation to grow a money crop like potato, as often as possible, is very great. There have been instances of the same land from which two potato crops had been annually removed for as long and continuous a period as 33 years.

Information on crop rotation studies on potato done in other countries, is mainly limited to investigations on the effects of continuous cropping of potatoes on the incidence of pests and diseases. Melhus, *et al*, (2) had obtained evidence of persistence of Powdery Scab organism in the soil even after a five-year interval between two potato crops. Scab control by a judicious rotation of potato varieties, including the resistant variety, *Jubel*, was recommended by Miss de Bruyn (1), if intensive cultivation of potatoes was necessary. Increasing the rotation between successive potato crops to six or seven years to control Common Scab has been suggested by Whitehead, *et al*, (4).

According to Thomas and Eyre (3), after the potatoes have been grown on the same land for ten to twelve years, it would be advisable to lay the field down to grass for two or three years and to graze it as much as possible thereby ensuring that trace elements, that might have been removed by the potatoes, are replenished. Citing the benefits of growing green manure crops like mustard, rape, ryegrass, clover, lupins and vetches, they have stated that such a practice was healthy, since it led to improvement in the organic matter content of the soil, the utilisation of nitrogen and other soluble plant foods left after lifting of potatoes and prevention of development of weeds. The relative values of the different rotational crops are not, however, specified.

In the absence of any local information available on the benefits of crop rotations for potato, studies were undertaken over a period of six years, commencing from 1942, and the results are reported in this paper.

A total of 17 rotational treatments was adopted to include various cereals and also lupins for green manure. Four different cereals, viz., barley, oats, *Samai* and *Korali* were used. The details of treatments are presented in the accompanying table:

DETAILS OF TREATMENTS.

Treatment symbol	First two-year rotation				Second two-year rotation				Third two-year rotation			
	1942		1943		1944		1945		1946		1947	
	April	Sept.	April	Sept.	April	Sept.	April	Sept.	April	Sept.	April	Sept.
A	P	P	P	P								
B	P	P	F	P								
C	P	P	F	S								
D	P	P	F	K								
E	P	P	F	B								
F	P	P	F	F								
G	P	P	F	O								
H	P	P	L	P								
I	P	P	L	S								
J	P	P	L	K								
K	P	P	L	O								
L	S	K	F	P								
M	K	B	F	P								
N	O	S	F	P								
O	S	K	F	P								
P	S	K	F	P								
Q	S	K	F	P								
R	B	F	F	P								
S	O	F	P	F								

B = Barley.

F = Fallow.

K = *Korali* (*Setaria pallidifusca*, Stapf and Hubbard)

L = Lupin.

P = Potato.

O = Oats.

S = *Samai* (*Panicum miliare*, Lam.) Little millet.

Each of the three two-year periods, viz., 1942-'43, 1944-'45 and 1945-'46, was taken as a unit of rotation, and the results of the three units examined statistically as a serial experiment, were significant for (1) seasons and (2) treatments, and for all the three interactions, viz., (1) blocks $\times$ seasons, (2) blocks $\times$ treatments and (3) seasons $\times$ treatments, as per the values extracted below:

Due to		C. D. (P = 0.05)	
		Observed	Calculated
1. Blocks	..	21.28	2.27
2. Seasons	..	16.51	3.06
3. Treatments	..	76.77	1.82
4. Interaction: Blocks $\times$ seasons	..	11.36	2.00
5. " : " $\times$ treatments	..	2.59	1.59
6. " : Seasons $\times$ "	..	3.74	1.59

An extract of the statistical examination of the combined yield values for all the three-year periods of rotation is given below:

Treatments	Acre yield of potatoes in lb.	Percentage of yield on control = 100 (H)
A	32,294	256.1
B	23,861	189.3
C	12,267	97.3
D	12,050	95.6
E	12,061	95.6
F	12,111	96.1
G	27,044	214.5
H	12,606	100.0
I	12,533	99.4
J	14,133	112.1
K	11,050	87.7
L	16,166	128.2
M	16,367	129.0
N	16,061	127.4
O	15,011	119.1
P	15,422	122.3
Q	15,306	121.4
R	15,733	124.8
S	15,944	126.5

Significant.

S. E. = 9.02.

C. D. (P = 0.05) = 1,782.

Conclusion: A, G, B, M, L, N, S, R, P, Q, O, J, H, I, C, F, E, D, K.

The conclusions are summarised below:

(1) Growing potato after potato, every year, twice in the same year, gave the maximum total yield, though steady and gradual reduction of yields in the years succeeding the first, and increase of pests and diseases were evident;

(2) Raising a green manure crop of lupins, in the second season (September) every year, maintained the optimum yield of potato, every year, in five out of the six years; it was also noted that raising of the green manure crop, instead of leaving the land fallow after potatoes, resulted in increased potato yields;

(3) While potato following cereals gave reduced yields, raising a green manure crop of lupins after potato (but not after cereals), restored optimum potato yields; and

(4) Of the various cereals tried, oats reduced the yield of the following potato crop to the maximum.

The results of the above crop rotation studies on potato, conducted during the six crop years, 1942-'47, have been summarised from the related Madras Agricultural Station Reports and represent the valuable work done on the subject by the staff of the Agricultural Research Station, Nanjanad, during the period. This is duly acknowledged by the authors in the preparation of this paper.

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Science for the farmer

by
R. M. SAVUR

Any one who wants to progress and improve upon his efforts must develop the habit of considering his actions objectively and critically. Such objective self-criticism is not easy. Knowing what others think of one is a great help. I know, because I have been the object of forthright and downright criticism during the last ten years I have been farming, and the criticism has been adverse without exception.

First, my purchasing a sandy waste-land for my farming venture instead of fertile land was (and, probably still is) considered extremely foolish. Latterly I have been considered crazy because I have taken to cultivating grass as a crop. These people derive confirmation of the correctness of their criticism from the absence of any appreciation of the need for pasture research in our State Agricultural Department.

In 1941, Ware, in an article "The cattle of India and their development" stressed the need for increasing the acreage under fodder crops. Figures given of the area of cultivated land per head of bovine population in India are 1.8 acres as compared with 3.4 acres in Great Britain, 4.5 in New Zealand, 31.4 in Canada and 24.9 in U.S.A. The I. C. A. R. made a belated start in grass research only in 1947. Few States departments have made even a tentative beginning.

The immediate food requirements of the country, no doubt, demand a rapid increase in the production of cereals. For this purpose our governments have taken the right step in encouraging increased outputs with a heavy use of synthetic fertilisers. What the effect of such strong stimulation of cereal crops by synthetic fertilisers will be in the long run upon soil structure and fertility has not been assessed. The experience in other countries of continuous and heavy cereal cropping with artificials has not been very encouraging. Future development in this country should be along lines laid down with a view to the permanence of the whole farming system and not solely from the point of view of immediate production of commodities saleable at the highest price for the time being. We pay far too little attention to soil-building farming systems, with the result that the soil is being destroyed by taking everything off and returning to the land little or nothing that will add to the humus content.

That grass as a crop can be as profitable as any other was realised by European farmers centuries ago. The inclusion of a grass crop in the crop rotation and of livestock to feed on the grass and help in maintaining soil fertility is a common feature of European agriculture. So much so that the E. Bruce Levy, the New Zealand expert, (New Zealand is a country whose agriculture is almost cent percent pastoral) remarks "In my recent trip abroad, perhaps nothing impressed me more than the part the animal played in building up and maintenance of soil fertility in Great Britain and Europe generally" and he adds a remark which is particularly applicable to our country—"stock in large numbers inadequately fed over a long period of time tend to ruin the country".

It was only after the first world war that the U. S. awakened to a realisation of the value of cultivated grass. Since then the awakening has been so thorough that today grass-land farming has become an important part of agriculture in the United States, and farmers keep a larger part of their crop land in grass to be rotated with arable crops, and all grass land is being made more productive by sowing better species and strains, by fertilising and other improved practices while practically all the States are making grassland farming a major part of their agricultural research and extension programmes.

In all under-developed colonial countries in tropical and sub-tropical regions under the control of European nations, especially the English-speaking ones, it has been the aim of agricultural experts to develop some system of alternate husbandry or mixed farming with grass as the pivotal crop for building up and maintaining fertility to ensure a stable income. For many years pasture research has been, and still is being conducted, and much advance has been made in colonies like West Indies, Anglo-Egyptian-Sudan, Nigeria, Gold-Coast, Zanzibar and S. Africa.

The reason for all this pasture research is obvious to those who study agricultural development in foreign countries. Any system, even mono-culture, will pay on very fertile soils but the area of such soils is very limited and is only a small fraction of the total area of cultivable land in any country. The major part consists of land which can be made very productive only if a suitable scientific system of farming is adopted which will provide a good and stable income while providing adequately for building up and maintenance of fertility. Alternate husbandry has been found

to be the best system so far devised for such marginal and sub-marginal lands. Alternate husbandry, however, cannot be adopted everywhere. It can be established only where climatic conditions, mainly humidity and rainfall, are favourable, or in arid and semi-arid regions where irrigation is possible.

This system of farming is entirely suitable for the whole of the coastal area comprising the South Konkan, S. Kanara and Malabar. For the sandy coastal belt this, I believe, will prove the only system which can make the cultivators of the infertile sandy soils as prosperous as the cultivators of the most fertile tracts of other districts. We have here the necessary unfailing rainfall while over much of the area supplemental irrigation is practicable. The temperature practically never goes above 100°F. The two factors which man cannot alter, viz., rainfall and temperature, are favourable for the practice of alternate husbandry. The other factors are within man's control.

There are now manifold forms of alternate husbandry but the essential common feature to all of them is the production of certain crops for human consumption or sale in combination with soil-improving forage crops for animal feeding. The problems are (1) Have we the soil-improving herbage species which will make it remunerative to grow grass as a cultivated crop?

(2) Have we the animals to be incorporated in the farm enterprise which have the physiological attributes that will make it a paying proposition to feed them with the more nutritious grass or forage crops produced at a greater cost than natural grazing and cereal straws?

(3) If the answers to both these are in the affirmative the problem still before us will be whether our agriculturists can be persuaded that the introduction of some grass-legume mixture or a soil-improving forage crop is desirable and feasible for the purpose of supplying a source of animal fodder and also for the purpose of improving the structure and therefore the fertility of the soil, both by root action and through the increased amount of animal manure which would be available. The production of more fodder from arable areas might also relieve the strain on grazing grounds which would thereby be given an opportunity to revive.

A Soil Profile Containing Abnormally High Phosphoric Acid

by

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Introduction: During the soil survey of Tanjore district, it was noted that the soil profile taken in the village of Pattiswaran contained an abnormally high amount of phosphoric acid. A detailed investigation was carried out to find out the nature and cause of this unusual phenomenon.

Pattiswaram is situated about three miles south-west of Kumbakonam. A rapid test for phosphoric acid in the surface soils of the village was conducted with the Purdue kit and it was noticed that the soils with high phosphorus content are located round about the hamlet of Injaladi.

Materials and Methods: A profile pit was dug at Injaladi (S. No. 156) to the water table to a depth of about six feet and the soil horizons were studied in the field and samples collected for examination in the laboratory. The details of the soil profile are given at the end. Four surface-soil samples of 0 to 9" depth were also taken at distance of 200 yards south, west, north and east of the profile pit for analysis in the laboratory. Surface samples selected at random were tested on the spot for phosphoric acid to find out the extent of the area high in phosphoric acid.

Results: The results indicate that the high phosphorus content in the soil is localised round about Injaladi in an area of about 200 acres. The soils of the region are Cauvery alluvium. The results of the analysis of the soils samples from the profile pit given in table I indicate that the phosphorus content is high in the first and second foot with about 50% of the phosphorus in the available form. There is an abrupt change in the third foot, the total and available phosphorus being very low. However, in the fourth and fifth foot of the profile the amount of total and available phosphorus again increases to much higher values than in the top soil. The third foot sample differs to some extent from the others in its mechanical composition and other chemical constituents also.

Examination of the mechanical separates of the profile samples shows that the phosphorus is concentrated in the finer fractions (Table II). The finer fractions contain about three

TABLE I
Analysis of samples of the profile pit (as percentages on oven-dry basis)

Soil sample No. depth	Loss on igni- tion	In- solubles	Iron and alu- mina	Cal- cium oxide	Magne- sium oxide	K ₂ O	Total P ₂ O ₅	Avai- lable P ₂ O ₅	Nitro- gen	Organic carbon	pH	Mechanical composition			SiO ₂	Fe ₂ O ₃ of clay
												Clay	Silt	Fine sand		
1. 0-6"	4.23	82.9	9.99	1.07	1.14	0.44	0.241	0.131	0.111	0.337	7.50	26.4	8.8	27.2	38.3	3.79
2. 6-12"	2.98	84.6	9.83	1.26	0.97	0.41	0.248	0.113	0.056	0.315	7.80	26.6	8.8	24.7	41.8	3.95
3. 12-24"	2.89	83.4	10.84	1.16	1.17	0.48	0.360	0.214	0.033	0.243	7.80	28.2	9.7	25.8	37.2	2.84
4. 24-36"	4.77	77.1	15.96	0.90	0.72	0.36	0.065	0.007	0.019	0.099	7.80	42.6	16.8	32.0	10.5	3.34
5. 36-48"	3.05	83.2	10.97	1.56	1.67	0.40	1.024	0.417	0.029	0.205	7.40	27.7	10.3	25.7	36.8	2.90
6. 48-60"	3.48	82.0	8.42	1.45	1.61	0.50	0.801	0.183	0.029	0.206	7.70	28.6	10.6	50.4	11.6	2.06

four times the phosphorus content of the coarser mechanical separates. The phosphorus-bearing material in the coarse fractions was separated by hand-picking and examined. It is greyish in colour and has a conglomerate structure. It is brittle and porous and gives effervescence with dilute hydrochloric acid. The data from chemical analysis of the material is given in table IV. From the chemical composition and from the examination of the material under the petrological microscope, it can be inferred that it is a secondary formation of carboxyapatite deposited over quartz and iron-bearing materials.

TABLE II
Phosphoric acid in the mechanical separates

Mechanical separate	Depth at which the sample was taken					
	0-6"	6-12"	12-24"	24-36"	36-48"	48-60"
Clay	0.584	0.565	0.847	0.142	1.35	0.946
Coarse fractions	0.179	0.203	0.221	0.034	0.379	0.269

TABLE III
Analysis of surface samples from the different corners of the hamlet

S. No.	Sample	Total P_2O_5	Available P_2O_5
1.	South	0.265	0.124
2.	East	0.173	0.017
3.	West	0.240	0.100
4.	North	0.123	0.020

TABLE IV
Analysis of phosphorus-containing material in percentages

1.	Loss on ignition (CO_2)	6.78
2.	Insoluble	54.45
3.	Fe_2O_3	7.94
4.	Al_2O_3	3.42
5.	CaO	12.84
6.	MgO	Traces
7.	P_2O_5	5.93
8.	P_2O_5 expressed as $Ca_3(PO_4)_2$	12.94

Discussion: The investigation reveals that the occurrence of the high amount of phosphorus is localised in about 200 acres of land round about Injaladi. It is not due to the occurrence of any phosphorus-containing minerals. It would appear that it is due to human agencies.

Arrhenius (1920) and Dauncey (1952) have explained the occurrence of high phosphorus content in the soils of certain Swedish farm lands and sites of ancient Roman settlements in England as being due to human settlements. The village of Pattiswaram is situated near the ancient Chola capitals of Kumbakonam and Palaiyur. It may be that the village especially the hamlet of Injaladi was the dumping ground for waste materials of Chola capitals. Since phosphorus is not mobile, it may have got deposited in the locality while the organic matter and nitrogen of the waste materials have been lost by decomposition and leaching. A more probable explanation of the high phosphorus content of the soils is that the site was the burial and cremation grounds of the Chola capitals. The high amount of phosphorus in the first and second foot of the soil may be due to cremation which is generally done on the surface and that in the fourth and fifth feet may be due to the remains of the burial of human bodies.

Summary and Conclusion: The occurrence of a high amount of phosphorus in the soils of Pattiswaram village was investigated. It was found that it is localised in the hamlet of Injaladi. Field survey, soil profile studies and laboratory examination of soil samples suggest that the high phosphorus content of the soils is probably due to human agencies, the site having been used as a burial and cremation ground a long time back.

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APPENDIX

Profile description:

- 0-5" Dark bluish grey clay loam, heavily cracked.
- 6-12" Dark grey clay loam.
- 12-24" Greyish brown clay loam.
- 24-36" Brownish silty clay.
- 36-48" Greyish brown clay loam moist.
- 48-60" Brown clay loam-very moist.
- 60" Water table.

The demarcations of the horizons are indistinct.

Groundnut Irrigation Experiment

by

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Introduction: Groundnut, which occupies nearly two million acres in this State is mostly raised as a rainfed crop in drylands. It is also raised as an irrigated crop in the summer season over an area of 1.5 lakhs of acres in the districts of South Arcot, Madurai and Tiruchirapalli. This latter cropping is important in many respects. Firstly the yields obtained are high, being on an average two to three times the yield obtained in the rainfed season. Secondly irrigated produce has about 2 percent more oil and is very valuable in the crushing industry. Thirdly the produce comes to the market in about July-August when the stocks of the earlier crop are almost exhausted and therefore the produce fetches a high price. Consequently the area under irrigated cropping is showing signs of increase. The improved irrigation facilities resulting from various ameliorative schemes have resulted in intensifying the cultivation of summer groundnut.

One notable achievement in this direction is the provision of irrigation from filter points in the wetlands as in Tanjore district, which has stimulated the cultivation of commercial crops in the rice fallows during the off-season. Groundnut and cotton are the only two commercial crops popular with the ryots and selection of a particular crop depends on the soil type. Cotton is exclusively raised in stiff clayey soils while groundnut is favoured in more open-textured soils. Even in this case the spreading type is selected in the loamy soils of the new delta area of Pattukkottai taluk. Irrigation is made cheap and effective from small wells temporarily excavated. In the clayey soils, the short-duration bunch type is preferred on account of its ease of harvest and also because fewer irrigations required. This is a step in the right direction as the production of these commercial crops is increased without encroaching on the area sown to food crops. The rice areas have a commercial crop to enrich the cultivators and the new rotational practice is also a beneficial one.

Nearly 50 percent of the area sown to irrigated groundnut is found in the taluks of Villupuram and Cuddalore in the South Arcot District. The crop is mostly raised in garden lands between

February and July. The crop receives about 12 to 16 irrigations and yields up to 5000 lb. of pods are obtained by judicious manuring with artificials. The number and frequency of irrigations decide the yield as well as the economics of cultivation. Since precise information on these aspects were not available, an experiment was conducted for the purpose and the results are presented in this paper.

Review of literature: At the Agricultural Research Station, Siruguppa (1941-'43) experiments conducted to determine the duty of water for different crops showed that it was 156 acres for groundnut (A. H. 45 - H. G. 1) in black cotton soils. Naturally this figure varies for different tracts as it depends on the soil type, climatic conditions, etc. The most important aspect of irrigation is the economics of cultivation and investigation on this does not appear to have been conducted anywhere.

Materials and methods: The experiment was carried out at the Agricultural Research Station, Palur. The soil of the station is deep, red, sandy loam typical of the area sown to irrigated groundnuts in the district. The following four treatments were adopted:—

- (A) Irrigation every 10th day.
- (B) Irrigation every 15th day.
- (C) Irrigation every 20th day.
- (D) Irrigation every 25th day.

The irrigations were given from the day of first flowering which is about 24 or 25 days from sowing. Prior to this, one irrigation was given for sowing and the second, life irrigation was given on the 4th or 5th day. The layout adopted was randomised blocks, replicated six times. A 1½ feet-wide bund separated each plot and the gross plot size was 28' x 12' in 1952 and 36' x 10' in 1953 while the net plot size was 24' x 10' in 1952 and 32' x 8' in 1953 after rejecting border rows all round. The irrigations were given as per schedule and they were copious being about 2 acre-inches each time. TMV 4 strain of spreading type of groundnut which is recommended for irrigated cropping in the tract, was selected and sowing done to a spacing of 1' x 1'. Intercultivation, harvest, etc., were attended to as usual.

Results: The statistical analysis of the yield data and the economics of the treatments were worked out in both the years and results are presented in the following tables.

TABLE I.

Groundnut—Irrigation Experiment—Yield data.

Treatment	1952 Summer			1953 Summer		
	Acre yield in lb.	Percent-age on control	Whether significant or not (P=0.05)	Acre yield in lb.	Percent-age on control	Whether significant or not (P=0.05)
(A) Irrigating every 10th day	1843	100.0	Yes	1669	100.0	Yes
(B) Irrigating every 15th day	1725	93.6		946	56.7	
(C) Irrigating every 20th day	1302	70.6		456	27.3	
(D) Irrigating every 25th day	1314	71.3		307	18.4	
Standard error	94.5	5.1		163.7	9.8	
Critical difference	284.0	15.4		493.0	29.5	

Conclusion:— A, B, D, C A, B, C, D

TABLE II.

Economics of the different treatments.

Treatments	No. of irrigations given	Cost of cultivation Rs.	Acre yield in lb.		Gross receipt Rs.	Profit or loss Rs.
			Pods	Haulms		
1952 Summer						
A Irrigating every 10th day	15	165	1843	3000	373	208 (Profit)
B " " 15th day	11	153	1725	2200	349	196 "
C " " 20th day	9	141	1302	1500	263	122 "
D " " 25th day	7	135	1314	1800	266	131 "
1953 Summer						
A Irrigating every 10th day	14	197	1669	3500	424	227 "
B " " 15th day	10	174	946	3400	241	67 "
C " " 20th day	9	164	456	2200	118	46 (Loss)
D " " 25th day	7	154	307	2000	81	73 "

(Note:— 1. Cost of irrigating an acre once is taken as Rs. 3/-.
 2. Pods valued at 5 lb. per rupee and vines at 500 lb. per rupee during 1952 and 4 lb. for rupee and vines 500 lb. per rupee during 1953 summer).

Discussion: The statistical analyses of the yield data were carried out and the yield differences attained the level of significance in both the years. Highest yield was obtained in both the years in the treatment 'Irrigating every 10th day' and there was progressive decline in yield as the interval increased.

The first year, i. e., 1952 was characterised by favourable distribution of rainfall (7.01" on 19 rainy days) and the temperatures were normal. But in the second year though the rainfall was more, 7.83 inches on 10 rainy days) it was received mostly towards the latter half of the crop life. The summer was severe and the season was altogether not very congenial for crop growth. This resulted in great reduction in yield as the interval between successive irrigations increased. Treatments (C) and (D) gave only 27.3% and 18.4% of the yield under treatment (A). It is clear that in a normal year there is not much difference between the first two treatments, but in a bad year even irrigating every 15th day has reduced the yields to half, showing the need for frequent irrigations.

The economics of the different treatments reveal that maximum out-turn is obtained by irrigating the crop every 10th day. In the first year irrigating every 15th day was just a little inferior to irrigating every 10th day. This indicates that in years of good summer showers and fairly low day-temperatures and in soils with good capacity for retaining soil moisture or when irrigation costs are high, irrigating every 15th day will be economical.

Summary: In an experiment to determine the optimum intervals for irrigating a summer crop of spreading groundnut, irrigating every 10th day after first flowering gave the highest yield as well as net return. This interval can be extended to 15 days in a year of good summer rains and in retentive soils but in adverse season this treatment will result in low yields and uneconomic returns.

Acknowledgement: Our thanks are due to the Superintendent, Agricultural Research Station, Palur for affording facilities for carrying out the experiment.

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Research Notes**Proliferation in the panicles of *S. nitidum*, Pers.**

In a culture of *S. nitidum* Pers., a species belonging to Para-Sorghum, collected from Maruthamalai hills near Coimbatore, it was found that though a large number of panicles was formed and there was normal exertion of anthers and stigma, no seeds were set. The glumes turned black on maturity as in many wild sorghums and the spikelet was fairly hard. When these were collected and sown no seedlings were obtained. During the present year (1955) with the onset of S. West monsoon there were continuous drizzles and the atmosphere was very humid. Two panicles which had been produced late in January 1955 were still on the plant and it was observed that foliar growths resembling seedlings appeared from the spikelets (Figs. 1 a & b). These on teasing out showed normal glumes, lemma and palea but in the place of seeds foliar growth had taken place. There was no root development though three to four leaves had been produced. However, when the proliferated spikelets were separated and placed in water, roots began developing but all these were adventitious (Figs. 2 a & b).

Similar foliation of spikelets have been recorded in maize, sorghum, ragi and other Gramineae. In sorghum the roots have been found to be produced even when the plantlets are enclosed in the glumes and still on the panicles. In *E. coracana* it is known to be gene-conditioned. In all these cases where such proliferated seedlings have been grown to maturity no panicles appeared but the foliation was repeated and it was possible to maintain this mutant from year to year by this vegetative multiplication. The present observation is interesting in that the parent plant, a 10-chromosomed Para-sorghum, exhibits parallel variation with the Eu-sorghum and is a first record of its kind in this sub-section of Sorghum. It is possible that this free-seeding species growing at an altitude of 3,500 ft. above m. s. l. and is probably self-sterile, may have been induced to this proliferation owing to lack of facilities for production of viable seed. The rooted proliferations have been planted into soil for further studies.

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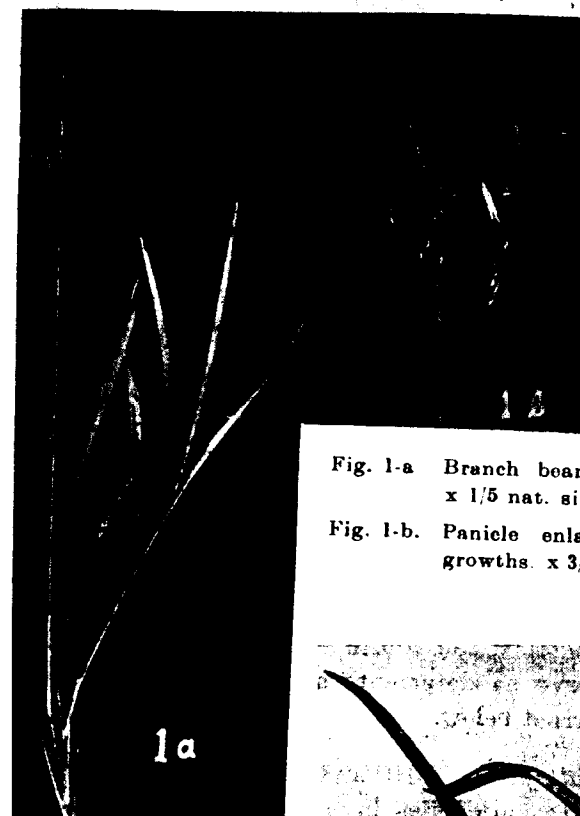
Proliferation in *S. nitidum*

Fig. 1-a Branch bearing the proliferated panicle, x 1/5 nat. size.

Fig. 1-b. Panicle enlarged showing seedling-like growths. x 3/5 nat. size.

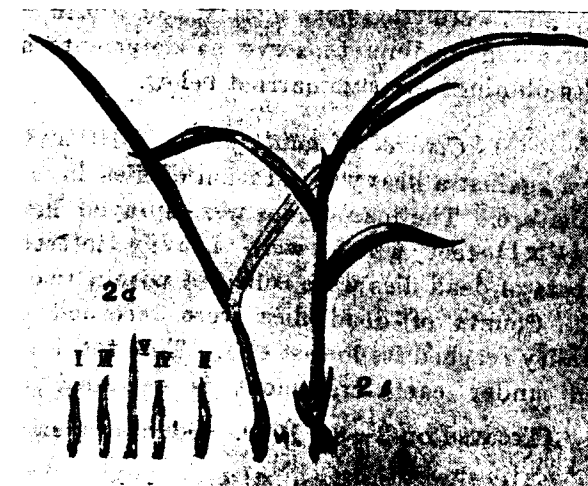


Fig. 2-a. Spikelet teased out x 2.

Fig. 2-b. Showing root growth in the proliferation. x 2.

A Note on the Control of the Housefly in Farmyards

Besides being notorious as a common carrier of organisms responsible for dreadful diseases and epidemics in man, the housefly is also a pest of importance in farmyards. It causes considerable annoyance to cattle by alighting on their bodies. Further, it falls into milk at milking time and pollutes it.

Ramakrishna Ayyar (1940) has recorded *Musca nebula* F and *Musca pattoni* A as the two species commonly noted in South India. They breed mainly on cattle-dung, horse-dung and nightsoil. Many entomologists have worked on the problem of controlling this pest. Ramakrishna Ayyar (loc. cit) recommends the use of fly traps and maggot traps for its control. Acharya *et al* (1945) found earth dung plastering and tarred cloth covering of 'katchra' layer over night soil to be effective anaerobic treatments. Fenton *et al* (1936) recommends a liberal treatment of manure with borax powder. Lal *et al* (1950) also found fly emergence very much less in compost treated with borax. Experiments were conducted at Coimbatore during the past few years for controlling this pest in farmyards by the use of insecticides like DDT and BHC. These insecticides were tried both against the adults and by application to the breeding medium to serve as deterrents and larvicides. The results obtained are summarised below.

(a) *Control of adult flies*: BHC and DDT were tried as sprays against a heavy infestation of flies in a farm building near Coimbatore. The insecticides were sprayed inside spacious halls of 24' x 14' x 11 feet which were heavily infested by flies. Large numbers of dead flies were collected within two hours after spraying BHC. Counts of dead flies were recorded daily till the rate of mortality reached its lowest ebb. The total number of dead flies noted under each treatment is recorded below.

(Treated on 2-9-1949. Counts taken till 14-9-1949).

Number of dead flies collected from sprayed rooms:

BHC (0.1%)	BHC (0.05%)	DDT (0.1%)	DDT (0.05%)
25,003	15,695	10,149	1,377

For the first two days after treatment, no mortality was observed under DDT while as much as 13,450 and 12,125 dead flies were noted under BHC 0.1% and BHC 0.05% respectively. BHC caused a much higher and quicker mortality than DDT.

(b) *Insecticides as deterrents to prevent oviposition*: Heaps of cowdung in blocks of 1½' x 1' x 4" were treated with BHC and DDT. The local practice of covering manure with tank silt was also tried. Fresh dung was heaped over the blocks for three more days, each time treating the dung with the insecticides. On the fifth day, the blocks were caged and the number of flies emerging from the dung heaps was recorded until emergence was completed. The data gathered from five trials conducted are recorded below.

Number of flies emerging from different treatments.

Treatments	I Sep. 1949	II October 1949	III January 1950	IV March 1950	V April 1950
1. DDT 5% dust	491	222	18	94	263
2. DDT 0.1% spray	22	226	26	47	37
3. BHC 5% dust	27	nil	1	nil	46
4. BHC 0.1% spray	nil	nil	nil	nil	nil
5. Tank silt covering	481	322	170	381	Not included
6. Control	136	210	52	37	221

BHC 0.1% spraying proved to be the best treatment, the next in merit being BHC 5% dust.

With a view to fixing the optimum dosage of BHC required for effective control, further tests were conducted in one-foot high earthen pots filled with cowdung free from oviposition. Borax reported to be effective was also tried. The concentration of BHC was brought down to 0.05%. Dosages of 2 oz. of the dust and one gallon of the spray per square yard surface were tried first. The population of maggots and pupae in the different pots was counted after one week of treatment. The data gathered are furnished below.

Treated on 17-1-1953.

Population in treated dung (total of four replications for each treatment).

BHC 5% dust 2 oz. per sq. yard	BHC 0.05% 1 gallon per sq. yard	Borax dust 2 oz. per sq. yard	Borax spray 1 lb. in 13 gallons (1 gallon per sq. yard)	Control
4	nil	16	4	138

Subsequently, BHC alone as dust at 2 oz. per square yard and as 0.05% spray at $\frac{1}{4}$ and $\frac{1}{2}$ gallon per square yard was tried. The data gathered are as below:

Treated on 31-1-1952.

Population of maggots in treated dung (total of four replications in each treatment).

BHC 0.05% $\frac{1}{4}$ gallon per square yard	BHC 0.05% $\frac{1}{2}$ gallon per square yard	BHC 5% 2 oz. per square yard	Control
nil	nil	2	56

Thus even a low dosage of BHC 0.05% spray at $\frac{1}{4}$ gallon per square yard proved to be effective in checking the flies.

(c) Treating against maggots present in breeding medium:

A definite number of maggots was introduced in earthen pots filled with cowdung and BHC as dust and spray was applied later on the dung surface, after the maggots had penetrated into the dung. The number of flies emerging from the dung was recorded and the figures gathered below show the superior larvicidal efficacy of BHC 0.05% even at $\frac{1}{4}$ gallon per square yard.

Treated on 31-1-1953.

(No. of maggots introduced in each replication: 50. Replications 4.)

No. of flies emerging from different treatments (total of four replications for each treatment).

BHC 5% 2 oz. per square yard	BHC 0.05% $\frac{1}{4}$ gallon per square yard	BHC 0.05% $\frac{1}{2}$ gallon per square yard	Control
4	nil	nil	54

Conclusion: BHC 0.05% at $\frac{1}{4}$ gallon per square yard proved to be quite effective for preventing oviposition and as a larvicide in the breeding medium. The cost of treating works out only to $\frac{1}{2}$ anna per square yard. BHC 0.05% was found to be very effective against the adults too.

Acknowledgment: The authors are thankful to Sri K. P. Anantanarayanan, Government Entomologist, Coimbatore for his valuable help rendered in preparing this note.

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A Note on *Crotalaria walkeri*.

Crotalaria walkeri is one of the lesser known species of *Crotalaria* and does not appear to be under cultivation anywhere as a green manure crop.

The plant is found to occur wild in the Anamalais on wastelands, grasslands, on hill-side cuttings and borders of swamps at elevations from 3,500 to 4,000 feet. It is also reported to occur in the Nilgiris and Palani hills at levels up to 6,000 feet.

A brief description of the plant is given below:—

A low herbaceous under-shrub, often semi-scandent, with numerous spreading branches, slightly striate, glabrous or nearly so; young parts very finely pubescent, leaves 2 to 4 inches long on short, stout petioles, oval or lanceolate oval, obtuse or acute, finely mucronate, glabrous above, usually puberulous beneath, stipules variable, usually very small, either subulate-linear or linear-lanceolate and very acute, or often falcate or semi-lunar, rarely foliaceous. Flowers rather large, one inch, on rather slender, short pedicel, 4 to 10 inches, erect, loose terminal racemes with two minute bracts immediately beneath calyx, calyx very finely puberulous, tube broadly campanulate, segments narrowly triangular-acuminate, pod 2—2½", tapering to distinct stalk at base, oblong, much inflated, especially at truncate apex tipped by short, broad-style base, very uberulous, seeds 7 to 10.

The plant is very hardy and drought-resistant and is not browsed by animals. It is able to grow on a variety of soil conditions and is easy to establish on land where other species of *Crotalaria* such as *C. anagyroides* and *C. striata* are difficult to establish. It is fairly rapid in growth, and attains a height of about 4 to 4½ feet and a spread of 3 to 4 feet within about 180 days. At this stage flowering also commences. It branches very profusely and branches arise from about one foot from ground level. After flowering it makes mostly lateral growth and in due course becomes a thicket, giving the ground a close cover.

The plant probably lives for about four years. It can be lopped twice a year for green material and an acre will yield not less than 30,000 pounds per year.

Propagation is from seeds or cuttings. A pound contains about 13,000 seeds and they give about 70% germination. They can be sown immediately after collection, and take about six days for germination. Seedlings stand transplanting well. Cuttings give over 80% success in rooting and can be directly planted out in the field during the rainy months. Self-sown seedlings appear in large numbers during rains.

Examination of a 6 months-old plant has shown that the tap root reaches a depth of about 16 inches and the lateral roots spreads to 60 inches. The roots contain innumerable bacterial nodules.

The plant appears to be highly suitable for reclaiming eroded lands, suppressing grass and keeping under cover plantation land which is rested between two cycles of crops. In view of its hardiness and ability to supply large quantity of green material it appears well worth a trial in wet and garden lands for supply of green manure.

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Reviews

Sindrome Policarencial Infantil (Kwashiorkor) and its prevention in Central America. by Marcel Autret and Moise Behar (F. A. O. Nutritional Studies, No. 13, Food and Agricultural Organisation of the United Nations, Rome. Oct. 1954; Orient Longmans Ltd., Madras.

We have for review the above publication of the F. A. O., on the results of a nutritional survey made in Latin America. The purpose of the survey was to compile data on the relation between the syndrome associated with protein deficiency to similar syndromes found in other parts of the world. Thus the joint F. A. O./ WHO Expert Committee on Nutrition, after reviewing a report on *Kwashiorkor* in Africa by Brock and Autret decided to send a joint mission to Central America in 1951 and a second mission to Brazil in 1953. The Central American mission began work in November 1951 and toured Guatemala, Honduras, Nicaragua, Costa Rica and Panama. A regrettable omission was Mexico; although Mexico was one of the Latin American countries where *Kwashiorkor* has been fully studied and where a scientific research programme was being conducted.

The publication describes the methods adopted in carrying out the investigation, the clinical features and medical aspects of the syndrome, the extent and intensity of its prevalence, the influence of diet on the syndrome and the various aspects of the treatment measures tried and concludes by suggesting ways and means of preventing the disease.

The term *Kwashiorkor* which has gained currency by usage to indicate the complex of malnutrition symptoms associated with protein deficiency in children, is derived from one of the Gold Coast languages. Since in actual practice; however, it is not possible to draw any sharp distinction between under-nourishment and malnutrition, the term is used to indicate broadly the main etiological factors and the stage of life when the syndrome is most common.

Kwashiorkor was found to occur in the Central American countries among poor people and the protein deficiency was almost always accompanied by a deficiency of calories and important nutrients. Retardation of growth, both in height and weight was the commonest and earliest of signs, though little or no attention is usually given to it to the poor families in which the disorder occurs. Functional retardation resulting from atrophy of muscles is also quite common, some of the children being unable to sit upright at ten months and unable to walk unaided even when two years old. The psychological changes are even more striking and characteristic, showing a mixture of apathy and irritability; "the children are indifferent to their surroundings and immobile for hours with open eyes and expressionless, mask-like features; often accompanied by a monotonous wailing without tears and the children refuse all food and whimper at the least touch" Physical and physiological symptoms are lack of appetite, diarrhoea, vomiting; liver enlargement and oedema. This last symptom is often associated with dehydration, thus oedema is marked in the extremities like the legs, feet and hands, while the trunk and face show wrinkling and loss in turgor of the skin tissues. The skin gets dry and even scaly, with pigmentary changes, peeling off and ulceration of skin-folds, while the hair becomes sparse and lifeless.

The proper treatment is essentially dietary. Where the disease has not assumed any serious stage, and the digestive troubles are not acute, a complete and balanced diet, consisting largely of skim milk, animal protein and fresh vegetables soon induce a marked improvement and return to normal health. Unfortunately in many cases the children are taken home by their parents before the cure is complete; in such cases relapses often occur and the mortality rate relapses is regrettably high.

reduces the insect population and lessens the severity of injury to the capsules. The clump rot infection has been traced to a *Pythium* fungus. This can be controlled by application of lime at the rate of three ounces per clump in the affected plantation, followed a month or two later by application of ammonium phosphate or superphosphate, at the rate of three ounces per clump. The above measures, besides arresting the disease, stimulate fresh growth of aerial shoots and enable the diseased clumps to revive quickly.

(Indian Farming, June 1955)

(ii) **Treating Groundnut Seed:** Treating groundnut seed with a fungicidal dust has been found to increase the germination capacity of the seed and give a better stand of the crop.

Treating the seed with 'Agrosan G.N.', 'Tillex' or 'Ceresan' increased germination capacity of groundnut seed from 10 to 13 per cent. Seed treated with 'Ceresan' controlled collar rot and wilt of groundnut.

Any of the three fungicidal dusts can be used for treating groundnut before sowing, at one part of the fungicide to 400 parts of seed. Seed is treated either in a seed mixer or by shaking it with the fungicidal dust for about five minutes in any closed vessel.

(Indian Farming, June 1955)

(iii) **Fertilizing Cotton:** Experiments on farmers' fields in the Hariana tract of the Punjab have confirmed the fact that there is a progressive increase in yield of kapas with increasing doses of ammonium sulphate, but beyond 75 pounds of nitrogen per acre, the increase in yield is negligible and is not likely to pay for the additional cost of manure. The tract grows about 1.25 lakh acres of cotton every year, and is an important long-staple growing zone of the State. The application of upto 75 pounds of nitrogen ($4\frac{1}{2}$ maunds of ammonium sulphate) is now being recommended to the Hariana tract cotton growers for increasing yields.

(Indian Farming, June 1955)

(iv) **A New type of ragi suitable for southern districts:** In the southern districts of Madurai, Ramanathapuram and Tirunelveli ragi is grown under irrigation in an area of about 1,75,000 acres. The crop is grown in two seasons, one during summer i.e. April to July and the other in the main season i.e. middle of September to December. Nearly two-thirds of the area under this crop is cultivated in the main season. In the early years work on the improvement of this crop was carried out at the Agricultural Research Station, Koilpatti, by getting selections from the Millet Breeding Station, Coimbatore and conducting trials with local ragi as control to assess their yielding capacity. Out of a number of selections like E. C. 47, Co. 1, Co. 2, Co. 4 etc., compared with the locals, only Co. 2 was found to be suitable for the summer season of this tract. Selection work in this crop was also done for a long time and the strain K. 1 ragi giving 18% more yield of grain than the locals was released in 1948.

Ragi K. 1. being a heavy yielder was found to lodge at harvest time. To get over this defect further work was done by selection. One selection, K. R. 4 gave a very good yield as good as K. 1 strain but without lodging. K. R. 4 is a purple-pigmented type and is resistant to blast disease. This selection was tried against the local ragi at various centres in the southern districts and very encouraging reports were received. On an average the yield of this selection is 20% over the local ragi. A large quantity of seed is being produced at the Agricultural Research Station, Koilpatti. Interested ryots can place their orders to the nearest Agricultural Demonstrator who will arrange for its supply.

(v) **Manure Pepper vines for better yields:** Pepper plantations in our State are seldom manured, unlike those in other countries. In South-East Asian countries like, Sarawak, Malaya, Cambodia etc., pepper vines are regularly manured. This regular application of manures to vines is reflected in their yield. The average annual yield of a vine in our state is about 0.75 lb. as against an average yield of about 3 lb. per vine in Malaya and Sarawak. Since the yield of pepper vine in any variety depend on the volume of new growth from the lateral branches of the vine, the yield is fostered by abundance of lateral branches and of new shoots from the lateral branches. Application of nitrogenous manure in conjunction with phosphatic manure and lime has resulted in increased yields.

From a consideration of all aspects of proper cultivation, the following manurial schedule may be recommended.

For vines in full bearing:

1. Half pound of slaked lime per vine may be applied in March-April with the receipt of summer showers in alternate years.
2. Well-rotten cattle manure or compost at the rate of about 20 lb. per vine may be applied before the advent of the South-West monsoon.
3. One to two lb. of groundnut cake, castor cake or fish manure per vine may be applied in two doses, one in May June and the other in August-September.
4. Two to four oz. of sulphate or muriate of potash or one or two lb. of wood ash per vine may be applied in August-September.
5. Four to eight oz. of ammonium sulphate per vine may be applied in two doses, one in August-September and the other in October-November.
6. Half to one lb. of superphosphate or bonemeal per vine may be applied in two doses one in August-September and the other in October-November.

Manurial Schedule for young vines.

1. Slaked lime at the rate of about 4 oz. per vine may be applied in March-April in alternate years.
2. Liquid cattle manure may be applied 3-4 times in a year or well-rotted cattle manure or compost at the rate of 10 lb. per vine may be applied, preferably mixed with cattle manure.
3. Ammonium sulphate about 2 oz. in an year per vine, may be applied preferably mixed with cattle manure.
4. Groundnut cake, castor cake or fish manure, about 3 oz. per vine, may be applied in two doses, one in June and the other in August-September.
5. Superphosphate or bonemeal about 4 oz. per vine may be applied in August-September.
6. Muriate of sulphate of potash about 2 oz. or 8 oz. of wood ash may be applied in August-September.

Application of manures except slaked lime is to be 6-12 inches away from the stem of the vine all round and within a radius of 2-5 feet all round, depending upon the age and growth of the vines. For young vines apply nearer and for older ones farther. Slaked lime may be applied even close to the vine and to a radius of 2-5 feet all round. Except potash and ammonium sulphate, the other manures are to be worked into the soil to a depth of about 6 inches. Potash manures are to be applied only about a fortnight before or after the application of ammonium sulphate. To reduce soil erosion, to replenish the humus content and to smother weed growth, to fix atmospheric nitrogen in soil and to prevent soil erosion during summer, a cover crop of *Calopogonium mucunoides* should be sown in pepper plantations.

Pesticide-Hazards: Some of the newer pesticides are remarkably effective and at the same time very dangerous if mishandled — not that the older pest-killing materials were to be treated carelessly. Like electricity, which is eminently useful, but extremely dangerous if not properly surrounded by suitable precautions, pesticides must be insulated from irresponsible people and uncontrollable conditions likely to cause accidents. A closed system for handling insecticides is an important safety measure. Potentially dangerous materials are introduced into spray tanks by mechanical means rather than poured by hand from shipping containers many times a day, thus multiplying accident opportunities.

Weeds: It has been estimated that the cost of controlling weeds, in actual cash and labour charges and in crop losses, is greater than the combined cost of fighting all other pests that plague agriculture. Further, weeds use up astonishing amounts of water; thus Bermuda grass (*Cynodon dactylon*) and similar persistent weeds use about 1,000 pounds of water for each pound of weeds (dry weight) that grow in the field space. (California Citrograph 40, April 1955) [T. R. N.]

Can cattle avoid infected grass? It is suggested that the bovine habit of not grazing grass growing in the vicinity of cattle-dung has a protective value against parasitic infection. In cattle lung-worm infection, it is necessary that the bovine host should ingest cattle dung, for the parasite to gain entry into the body of the host.

By watching cattle in a field infested with *Dictyocaulus viviparus* it is confirmed that bovine grazing is indeed highly selective, because grass samples collected from "grazed" spots contained far less of the larvae of cattle lung-worms than random grass samples. It is therefore clear that the success of the animal in avoiding infection depends upon something more than its ability to distinguish between the short grass and the rank tussocks of herbage growing round pats of cattle-dung. (Nature; 175, June 1955)

Efficacy and economics of liquor ammonia as a fertiliser to Cotton: (Ind. Cotton Gr. Review 9 P. 27) Nitrogen in the form of ammonium sulphate costs 14 annas a pound while it works out to Rs. 5-4-0 as ammonia. Therefore, unless it is very much cheaper there is no great point in recommending liquid ammonia, because of the difficulties and hazards in handling and transporting the material. [T. R. N.]

M. Sc. DEGREE

Sri N. V. Sundaram, Assistant in Mycology, has been declared qualified for the M. Sc. degree by the University of Madras, the subject of his thesis being Study of Rusts occurring in the neighbourhood of Coimbatore.

Weather Review — For the month of August, 1955.

RAINFALL DATA (IN INCHES)

Division	Station	Total rainfall for the month	Departure from normal	Total since 1st January	Division	Station	Total rainfall for the month	Departure from normal	Total since 1st January
North	Madras (Meenam-bakkam)	9.1	+ 4.5	26.5	South	Madurai	2.1	- 2.0	14.7
	Tirur-kuppam*	7.2	- 2.4	25.6		Pamban	0.2	- 0.4	13.9
	Vellore	2.3	- 3.4	19.4		Koilpatti*	0.6	- 1.6	10.4
	Gudiyatham*	3.5	- 1.0	17.5		Palayam-cottai	0.0	- 0.7	9.5
						Amba-samudram*	0.0	- 0.4	15.7
East Coast	Palur*	4.0	- 1.4	33.7	West Coast	Trivandrum	2.1	- 4.6	41.0
	Tindivanam*	10.3	+ 5.7	24.9		Fort Cochin	4.8	- 9.1	99.1
	Cuddalore	6.0	+ 1.2	33.3		Pattambi*	6.1	- 7.6	66.5
	Naga-pattinam	5.6	+ 2.5	22.6		Kozhikode	9.5	- 7.6	102.7
	Aduturai*	6.4	+ 1.8	24.4		Taliparamba*	15.8	- 10.1	105.8
Central	Pattukottai*	6.7	+ 2.3	16.3		Wynaad*	6.7	- 8.3	54.5
	Salem	4.0	- 2.6	21.7		Nileshwar*	17.9	- 7.0	143.3
	Coimbatore (A. M. O.)*	0.4	- 0.9	10.8		Pilicode*	13.3	- 9.8	116.2
	Coimbatore	0.4	- 0.8	13.2		Mangalore	25.9	+ 0.4	116.9
	Tiruchirappalli	1.4	- 2.7	15.4		Kankanady*	24.6	+ 0.1	116.2
					Hills	Kodaikanal	2.2	- 4.8	38.3
						Coonoor*	1.2	- 2.6	21.1
						Ootacamund*	2.2	- 1.7	41.2
						Nanjanad*	2.6	- 5.3	41.3

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

In the first week of the month the South-West monsoon was fairly active along the West Coast and also in Travancore-Cochin. Localised showers were received at a few places in Tamilnad as well. The monsoon became weak in the West Coast on 8-8-1955 and remained so till 11-8-1955. But in this period mild showers were received at a few places in Tamilnad. The monsoon became temporarily active again along the West Coast on 12-8-1955 and remained so for four days. The districts constituting Tamilnad had some drizzles or light showers till 15-8-1955.

Coastal areas in Tamilnad received good rains on 16-8-1955. On 17-8-1955 the monsoon strengthened in Travancore-Cochin. Three days later widespread rains were received in Malabar-South Kanara districts and also at a few places in Tamilnad and this condition remained practically unchanged till 24-8-1955. On 25-8-1955 conditions became unsettled in the West Central and adjoining North-West Bay of Bengal, with the result that rainfall was heavy in the West Coast and fairly heavy in a few places in Tamilnad. From 26-8-1955 to the end of the month West Coast had some localised rains and a few places in Tamilnad had light showers.

Both in the West Coast and on the hills rains received during August 1955 were normal. The rains received in Tamilnad were quite insufficient for agricultural

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

Note-worthy Rainfalls			Zonal Rainfall			
Date	Name of Place	Rain-fall in inches	Name of Zone	Average rainfall for June, 1955	Departure from normal	Remarks
1/8/55	Nileshwar	3.2	North	5.5	— 0.6	Just below normal
7/8/55	Madras (Meenambakkam)	2.0	East Coast	6.5	+ 2.0	Above normal
do.	Nagapattinam	2.0	Central	2.1	— 1.3	Below normal
12/8/55	Mangalore	5.0	South	0.6	— 1.0	Below normal
do.	Madurai	2.0	West Coast	12.7	— 6.7	Below normal
22/8/55	Madras (Nungambakkam)	4.0	Hills	2.1	— 3.6	Far below normal

Agricultural Meteorology Section,
Lawley Road P. O.,
Coimbatore, 14—9—1955.

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

News and Notes

The students of the II year B. Sc. (Ag.) class went on tour from 16th of this month to 24th. The College was closed on 25th for the Michaelmas holidays.

During this month we had a number of Hockey, Volley-Ball and Basket-Ball matches with teams from Colleges and Schools of Mangalore, Udipi and Tiruchirappalli.

The night school run by the Social Service League was also closed for the vacation.

Departmental Notifications Gazetted Service—Postings and Transfers.

Name and present post	Posted as
Venkataraman, V. G., Marketing Asst., Madras,	Spl. D. A. O., (Crop Sampling), Tanjore.

Upper Subordinates

Name and present post	Posted as
Abdul Samad, N. M., Rajapalayam,	A. D., Ettayangudi.
Andrew Desabandhu, Vaunarpettai,	Cotton Asst., Koilpatti.
Antony, C. R., Kozhikode,	A. D., Kinathukadavu.
Alfred, Trichy,	A. D., Thirumayam.
Appadurai, R., A. R. S., Koilpatti,	Millet Asst., Coimbatore.
Balasubramaniam, K. M., Paddy Asst., Coimbatore,	Paddy Asst., Tirur.
Balakrishnan, C., Dharmadam,	Asst., in Mycology, Ootacamund.
Balasubramaniam, V. P., Dindigul,	A. D., Shembanarkoil.
Bhaskaran, P., Olavakkot,	A. D., Mudukulathur.
Chami, A., A. D., Ellayangudi,	A. D., Pollachi.
Chellappa, K. K., Kosepet,	A. D., Arni.
Chandrasekhara Shetty, Triplicane,	Entomology Asst., Kasargode.
Doraiswami, K. N., A. D., Shembanarkoil,	A. D., Salem.
Danesh Rao, H., Mangalore,	A. D., Palamedu.
Divakaran, N. K., Nellayi,	A. D., Avoor.
Divakaran, K., Asst., in Millets, Coimbatore,	A. R. S., Koilpatti.
Gopalakrishnan, A., A. D., Ramapuram,	Extension Officer, in Agri. Byadoor.
Gopalakrishnan, P. K., Fruit Asst., Coimbatore,	Ginger Asst., Wynaad.
Gunaseelan, L. M., Adiperananoor,	Paddy Asst., Palur.
Jose, P. C., Kottapaddy,	Extension Officer, Ootacamund.
Gangadharavarman, V. N., Vandall,	Pepper Asst., Taliparamba.
Jayapalan, P., Palghat,	A. D., Tirupathur, Ramanathapuram Dt.
Jacob, K. G., Thittamal,	A. D., Uthukuli.
Kannan, S., Coimbatore,	A. D., Andhiyur.
Kumaran, Pullode,	Soil Conservation Asst., Kangayam.
Kanakasabapathy, T., Udamalpet,	A. D., Kalasapakkam.
Kandaswami, T. K., P. P. A., Pattukottai,	Asst. in Mycology, Coimbatore.

Name and present post	Posted as
Manamohan Lal, S., Paddy Asst., Palur,	Paddy Asst., Coimbatore.
Mohamad Azam, O. A., Coimbatore,	F. M., Satyamangalam.
Mohamed Ghouse, Madurai,	A. D., Theni.
Navaneethakrishnan, T. V., P. P. A., Pattukottai,	P. A. to D. A. O., Pattukottai.
Radhakrishna Reddy, A., A. D., Villivakkam,	A. D., Cuddalore.
Ramakrishnan, G., Entomology Asst., Coimbatore,	Fruit Asst., Coimbatore.
Ramana, G. V., P. A. to D. A. O., Trichy,	Asst., Lecturer in Agri. Coimbatore.
Ravindranath Menon, C., Puthiyuru,	A. D., Kuttalam.
Swaminathan, K., Paddy Asst., Coimbatore,	Paddy Asst., Aduthurai.
Srinivasan, P. M., Entomology Asst., Kasargode,	Entomology Asst., Coimbatore.
Stanley Francis Bernad, Thalayuth,	Spl. A. D., Cotton, Ettayapuram.
Sundaravaradan, S., Madras,	A. D., Villivakkam.
Swaminathan, R., Palghat,	Millet Asst., Coimbatore.
Samuel, T. V., Karungapalle,	Certification Inspector, Rajapalayam.
Sivaraman, A. K., Ottapalam,	A. D., Pennadam.
Subramaniam, T. L., Coimbatore,	Asst., in Cotton, Coimbatore.
Sundaram, V., P. A. D., Rasipuram,	A. D., Sankaridrug.
Selvaraj Carvalho, A. D., Sankari,	A. D., Trichy.
Sankarasubramaniam, T. K., P. A. to D. A. O., Pattukottai,	P. A. to D. A. O., Cuddalore.
Varadarajan, K., Saidapet,	Chemistry Asst., Coimbatore.
Venkatarangam, R., Cane Asst., Palur,	O. S. Dev. Asst., Cuddalore.
Thulasidas, G., Ginger Asst., Ambalavayil,	Cane Asst., Palur.

We are all strong enough to endure other people's misfortunes.

— La Rochefoucauld.

"First she's gloomy, then she's gay" reflects the old grand-mother, "that means she's in love".
"Are you sure"? asks her son — "Yes" is the reply.
"What a memory"! he exclaims.

After giving a talk on "How to train your memory" the speaker shook hands all round and departed, leaving his hat behind.

DISTRICTS

S. ARCOT, COIMBATORE
MALABAR, S. KANARA
RAMANATHAPURAM
TIRUNELVELI
NORTH ARCOT



CROPS

COTTON, GINGELLY
GROUNDNUT
COCONUT
ARECANUT
TOBACCO

Review of Market Conditions of Commercial Crops in the areas of Market Committees for August, 1955

Errata (M. A. J., August 1955)

Page 359, para 6, line 3 for figure 35,800 read as 53,800.

Page 361, para 1, line 1 for figure Rs. 80 to 19-6-0 read as Rs. 18-0-0 to 19-6-0.

Page 360, para 2, line 3, 780 for 1st quality read as Rs. 680.

and 2,953 clys. of Karunganni lint at the end of the month.

The *kapas* market at Tiruppur opened with a stock of 15,463 pothis of Cambodia and 2,824 pothis of Karunganni *kapas* as the carryover of the previous month. Arrivals during the month accounted for 18,158 pothis of Cambodia and 3,747 pothis of Karunganni which included a total of 18,426 pothis received from other districts. Disposal of *kapas* amounted to 20,740 pothis Cambodia and 3,957 pothis of Karunganni of which 9,090 pothis of Cambodia and 1,584 pothis of Karunganni *kapas* were used for ginning locally. A quantity of 12,881 pothis of Cambodia and 2,614 pothis of Karunganni remained as closing stock at the end of the month.

The cotton market in general was very active during the month.

2. *Koilpatti*: In Koilpatti market there was an opening stock of 500 pothis of Karunganni *kapas* at the beginning of the month. Fresh arrivals from neighbouring villages amounted to 1,000 pothis. Nearly 1,000 pothis were ginned and sold to the milles, leaving a closing of 500 pothis at the month end.

Though the season for Karunganni has come to a close it has been reported that 10,000 pothis are still left over with producers.

3. *Ramanathapuram District*: The three markets of Virudhunagar, Sattur and Rajapalayam put together opened with a carryover stock of 1925 clys. of Karunganni cotton lint. Arrivals during the month amounted to 6,120 clys. of lint which included 2470 clys. of Karunganni lint and 3,650 clys. of Madras-Uganda. Disposals of cotton during the month accounted for 6,245 clys. of lint which included 2,595 clys. of Karunganni and 3660 clys. of Madras-Uganda leaving a closing balance of 1,800 clys. of Karunganni cotton lint at the close of the month.

The *kapas* market at Virudhunagar, Sattur and Rajapalayam opened with a stock of 10,350 pothis of which 6,350 pothis were Karunganni cotton and 4,000 pothis of Madras-Uganda. Receipts in the month accounted for 35,550 pothis of which 10,400 pothis were Karunganni and 25,150 pothis Madras-Uganda. Disposals during the month were of the order of 38,300 pothis including 15,650 pothis Karunganni and 22,650 pothis of Madras-Uganda. A stock of 7,600 pothis of Madras Uganda was left over as the month—end stock. The market for Karunganni was in general brisk and active during the middle of the month and brisk transactions in Madras-Uganda were registered only in respect of good quality *kapas*.

4. *South Arcot*: The markets of South Arcot District started with an opening balance of 83 pothis of cotton *kapas*, while the receipts during the month amounted to 298 pothis. Disposals accounted for 226 pothis leaving a closing stock of 105 pothis at the end of the month.

Prices: 1. *Cotton Lint*: The price of lint in Tirupur market revealed an upward trend during the month. Cambodia lint went up from Rs. 900/- to Rs. 960/- and Karunganni from Rs. 785/- to Rs. 825/- per candy during the month. The rates for Cambodia lint per candy touched the level of Rs. 980/- by the close of the month.

Prices of Karunganni lint continued to be steady at Koilpatti market. The prices were fluctuating between Rs. 650/- to Rs. 700/- per candy according to quality. The prices of Madras-Uganda cotton also remained firm during the month and were placed at Rs. 1,130/- per candy for certified quality and Rs. 1,000/- per candy for uncertified quality.

Market for Karunganni cotton lint in the three markets of Virudhunagar, Sattur and Rajapalayam opened steady at Rs. 650/- to Rs. 700/- for I Crop, Rs. 610/- to Rs. 630/- for II Crop good quality and Rs. 545/- to Rs. 575/- for II Crop second quality and Rs. 490/- to Rs. 515/- for Tinny-Karunganni mixture per candy. The beginning of the m

experienced a slight recession in prices but later the market steadied itself and throughout the remaining period stood as follows:—

I Crop	Rs. 656-686 per Candy
II „	Rs. 556-571 „
Tinny-Karunganni Mixture	Rs. 500-516 „

The prices of Madras-Uganda cotton lint opened at Rs. 1,086/- to Rs. 1,131/- for M. U. I. certified, Rs. 1,186/- for M. U. II certified and Rs. 986/- for uncertified qualities. There was a slight upward trend during the month and the market closed better and firm at Rs. 1,141/- to Rs. 1,151/- for M. U. I. Certified, Rs. 1,236/- to Rs. 1,256/- for M. U. II Certified and Rs. 1,006/- for uncertified Madras Uganda per candy. There was a greater demand for certified lots of Uganda.

2. *Kapas*: The price of *kapas* in Tirupur market maintained a steady upward trend during the month. The prices of Cambodia and Karunganni *kapas* were ruling at Rs. 110/- to Rs. 114/- and Rs. 90/- to Rs. 95/- per pothi against Rs. 116/- to Rs. 127/- and Rs. 97/- to Rs. 100/- that was prevailing during the corresponding month of last year.

The price of Karunganni *kapas* in Koilpatti market opened at Rs. 77/- per pothi and declined gradually and closed at Rs. 74/- per pothi. Price of Madras Uganda *kapas* which opened at Rs. 115/- per pothi rose up to Rs. 120/- by the middle of the month and thereafter maintained a steady tone.

The prices in the markets of Virudhunagar, Sattur and Rajapalayam for Karunganni *kapas* opened at the rates of Rs. 70/- to Rs. 84/- for I Crop and Rs. 53/- to Rs. 63/- for II Crop and after a slight recession, kept up a steady level at Rs. 76/- to Rs. 80/- and Rs. 35/- to Rs. 68/- per pothi respectively. The market for Madras Uganda *kapas* in these markets opened at Rs. 132/- to Rs. 136/- for M. U. II Rs. 122/- to Rs. 131/- for I quality Madras Uganda and Rs. 105/- to Rs. 118/- for II quality Madras-Uganda. The prices ruled firm for the I and II quality during the month while cotton revealed an upward trend and closed higher at Rs. 136/- to Rs. 149/- per pothi.

The average prices of *kapas* (Cambodia) in the markets of South Arcot District ranged from Rs. 70/- to Rs. 74—8—0 per pothi during the month.

3. *Cotton Seeds*: The price of cotton seeds in Koilpatti market opened at Rs. 22/- per pothi at the commencement of the month and gradually advanced to Rs. 25—8—0 at the month end. The prices of Karunganni cotton seeds at the markets of Virudhunagar, Sattur and Rajapalayam markets opened in the range of Rs. 18/- to Rs. 20/- and improved to Rs. 22/- to Rs. 23—8—0 per pothi of 252 lb. The Uganda seed which opened at Rs. 15/- per pothi of 252 lb. went up to

Rs. 15-12-0 to Rs. 16/- in the middle of the month and closed at Rs. 15-6-0 to 15-12-0 at the closing period under review.

II. Groundnut: (In this section Candy=531 lb. of Kernels; Bag=80 lb. of pods.) The groundnut markets in South Arcot districts opened with a stock of 2,741 tons of kernels with the trade at the beginning of the month. Arrivals into eight regulated markets amounted to 9,586 tons. Receipts from outside the district and other States included 628 tons and 54 tons respectively. Disposals to oil millers and country chekkus amounted to 4,973 tons and 129 tons respectively. Despatches to places outside the district and the State accounted for 2,253 tons and 4 tons respectively. A closing balance of 5,650 tons of kernels remained at the end of the month.

The average prices of groundnut kernels in the several markets of South Arcot district ranged from Rs. 99-5-0 to Rs. 109-15-0 per candy during the month. The prices of kernels at Virudhunagar market which opened at Rs. 110/- to Rs. 115/- per candy steadily increased in the middle of the month and rose upto Rs. 118/- to Rs. 120/- and finally closed slightly lower at Rs. 114/- to Rs. 118/- at the closing period.

III. Gingelly: (Bag in this section is 168 lb. each.) The stock of gingelly in the markets of South Arcot district opened with 728 bags at the beginning of the month. Arrivals in the six markets were 559 bags of which 407 bags were received at the Viruddachalam market alone. Receipts from outside districts from Tiruchirapalli and places in North Arcot district amounted to 110 bags in all oil mills and country chekkus consumed 16 bags and 338 bags respectively during the month. Despatches to other districts and States amounted to 75 bags and 20 bags respectively, leaving a closing stock of 946 bags.

The average prices in different markets of South Arcot district ranged from Rs. 30-2-0 to Rs. 40-1-0 per bag of 168 lb. each.

IV. Coconut and its Products: 1. Copra: The four markets of Malabar district (Kozikode, Ponnani, Badagara and Tellicherry and Dharmadam) opened with a stock balance of 7.4 million nuts. Receipts into all these markets amounted to 7 million nuts. Despatches and local sales accounted for 5.4 and 0.2 million nuts respectively leaving a month end stock of 8.5 million nuts.

Prices of coconuts in Malabar markets stood in the range of Rs. 70/- to Rs. 100/- per 1,000 husked nuts. The rates at Mangalore market ranged for Rs. 140/- to Rs. 170/- for 1,000 raw nuts and Rs. 165/- to Rs. 210/- for dry nuts.

2. Copra: (In this section candy is 700 lb.) The two markets of Malabar at Kozhikode and Badagara opened with a carryover

1,813 odys. while the arrivals during the month accounted for 3,808 candies. Despatches and local sales were of the order of 2,465 candies. Despatches and local sales were of the order of 2,465 candies and 2,310 candies respectively, leaving a closing stock of 1,846 candies at the end of the month.

Prices of copra in Malabar district showed a slight decline during the month. The price ranges as between the several varieties in the different markets are extracted below.

(Prices per candy of 700 lb.)

Varieties	Kozikode		Badagara	
	Maximum	Minimum	Maximum	Minimum
Office	315	297	305	290
Edible	335	315	320	315
Rajpur	400	375	400	375
Madras	370	370	340	340

Prices of Copra in Mangalore markets ranged between Rs. 285/- to Rs. 305/- per candy of 660 lb.

V. Arecanut: (In this section bag = 100 lb.) The stock of arecanuts in Mangalore market opened with a quantity of 3,587 cwt. at the commencement of the month and 1,300 cwt. were added to it by way of receipts. Exports during the month accounted for 1,809 cwt. leaving a closing stock of 3,078 cwt.

The price ranges of arecanuts in Mangalore markets are indicated below:—

(Prices in Rs. per Cwt.)

Varieties	Maximum	Minimum
Choll	180	160
Koka	130	85

The stock of arecanut in Kozikode market opened with 981 bags and 6,466 bags were added by receipts during the month. Despatches took way 5,393 bags leaving a closing balance of 2,054 bags at the end of the month.

VI. Tobacco: (In this section candy=500 lb.) In Coimbatore district the markets started with a carryover stock of 14,145 candies of chewing tobacco and 7,145 candies of cheroot tobacco at the beginning of the month. Despatches made to places outside the notified areas amounted to 3,846 candies of chewing and 2,116 candies of cheroot tobacco. The market closed with a stock of 11,776 candies of chewing tobacco and 5,029 candies of cheroot tobacco at the end of the month.

The prices ruling as between different varieties are extracted below:—

Variety	(Per candy of 500 lb.)		
	I Grade	II Grade	III Grade
	Rs.	Rs.	Rs.
1. <i>Chewing Tobacco, Suncured:</i>			
(a) Meenampalayam	460 to 520	375 to 435	290 to 350
(b) Other varieties	350 to 400	220 to 275	150 to 200
2. <i>Cheroot varieties:</i>			
Sun-cured (grown in Erode and Bhavani Taluks)	225 to 300	160 to 200	120 to 150
3. <i>Chewing varieties:</i>			
Pit cured (grown in Palladam & Sular area)	240 to 320	175 to 225	120 to 150

Review of the Activities of Market Committees during the month of August 1955

Of the seven Market Committees in the State only five in the districts of North Arcot, South Arcot, Coimbatore, Malabar and South Kanara continued to be actively functioning. The activities of Committees at Ramanathapuram and Tirunelveli continued to be restrained due to injunction order of the Madras High Court.

The following progress was made by the Market Committees during the month in the issue of licences under Madras Commercial Crops Markets Act.

Commodities	Sec. 5 (1)		Sec. 5 (3)		Weighman		Broker	
	A	B	A	B	A	B	A	B
North Arcot Market Committee ...	No report							
South Arcot Market Committee ...	136	1,455	140	1,652	190	970	...	5
Tirunelveli Market Committee ...	...	...	...	...	...	...	...	...
Coimbatore Market Committee ...	67	356	73	433	68	385	...	7
Malabar Market Committee ...	25	405	72	1,191	41	207	...	5
South Kanara Market Committee ...	4	213	2	175	...	38	...	...
A—During the month.								

The total volume of transactions in commercial crops in 13 regulated markets in the State during August 1955 is extracted below:—

Crop	Quantity	No. of Regulated Markets
Groundnut kernels	9,205 tons	8
Gingelly	445 bags	5
Cotton lint	3,414 candies	3
Kapas	9,078 pothis	3
(Candy = 784 lb. Pothi = 280 lb. Bag = 168 lb.)		

II. *Meetings:* South Arcot Market Committee: Two meetings were held of the South Arcot Market Committee during the month under report. Among the several subjects taken up for discussion, the most important were the following:—

(a) Sanctioning of a sum of Rs. 100/- for the purchase of seeds and plants for Vanamahothsavam.

(b) The appointment of a clerk at the Committee's cost in the Collectorate to attend to the issue of licences was felt as unnecessary as no other Market Committee is maintaining any clerk as such.

(c) Continuation of the post of the Assistant Secretary in the Committee was decided on owing to heavy work due to addition of two more crops from 1953.

(d) Deletion of the footnote found below, by-law 24 (6) (b) to remove the ambiguity was also resolved on.

Malabar Market Committee: A meeting of the Committee was held during the month. A few of the important subjects considered are extracted below:—

(1) Approval of the action of the Chairman in withdrawing Rs. 25,000/- from fixed deposit in the Malabar District Co-operative Bank and Rs. 15,000/- from current account and investing Rs. 40,000/- in the 4% Madras Loan 1967, with the approval of the Director of Agriculture and in anticipation of the Committee's approval.

(2) Regarding the amendment to rule 36 of the Madras Commercial Crops Markets Rules 1948 to include provisions in the Act for checking vehicles conveying commercial crops, the Committee resolved that sufficient powers may be taken by the Government in the Act itself to enable them to amend Rule 36 so as to make necessary provisions for the Committee's servants to block the roads if and when and search vehicles, animals or conveyances suspected to

III. Special Features: A conference of Chairman of all the Market Committees in the State was held at Villupuram on 7-8-1955 which was inaugurated by the Minister for Agriculture, Madras. An exhibition explaining the activities of regulated markets arranged by the South Arcot Market Committee was also opened by the Minister on the occasion. All the Secretaries and Chairmen of Market Committees, the two Assistant Marketing Officers and other officers attended the Conference. The Committee on Co-operation appointed by the Govt. of Madras visited Cuddalore O. T. Market on 27-8-1955 to study the working of the regulated markets.

An expert committee appointed by the Government of Bombay to enquire into the working of regulated markets in that State paid a visit to Madras and the regulated markets of South Arcot Market Committee at Tindivanam and Villupuram in the last week of the month. The State Marketing Officer explained to them the working of the act in this State besides taking them to the Regulated Markets.

IV. Quality Appraisal: South Arcot Market Committee continued its work on the studies on the quality of groundnut kernels marketed in six of its regulated markets including Panruti on the basis of random sampling. A total of 582 samples of kernels was drawn from arrivals of 23,386 lots of kernels comprising of 5779 tons of kernels and each lot was analysed for quality factors. The broad details of the analysis comprising determination of dryage and total refractions (comprising of (i) Dirt and Foreign matter (ii) Nuts in shell (iii) Splits (iv) Damaged (v) Broken and (vi) Shrivelled) are of interest and are extracted below:—

Particulars	Panruti	Cuddalore	Villupuram	Tindivanam	Tirukoilur	Virdhachalam
1. Dryage:						
2% and below	..	4	3	15	4	92
Above 2% and upto 3%	..	6	2	7	..	19
„ 3% „ 4%	..	6	4	9	13	15
„ 4% „ 5%	45	106	14	35	87	6
„ 5% „ 10%	59	16	7	8	..	..
Over 10%	..	..	..	..	..	..
2. Total refractions:						
4% and below	5	8	13	4	39	130
Above 4% and upto 8%	8	69	17	16	53	..
Above 8%	91	61	..	..	..	..

(Figures in the above statement relate to the two markets with a carryover of)

It would be seen from the above statement that dryage was at its minimum, within 2%, in majority of the lots at Vridhachalam (nearly 69.6 of the total number of samples analysed) while it is high in the markets of Cuddalore, Tirukoilur and Tindivanam ranging between 6 and 10% in 76.8%, 83.6%, 47.3% of the total number of samples analysed. At Panruti all the samples showed dryage between 6 and 10%. In the matter of refraction Vridachalam accounted for 98.5% of its samples for refraction under 4% while markets of Panruti and Tindivanam recording alone 8% refraction majority of the samples.

Fifty-two entries were secured for quality competition in groundnut kernels marketed in South Arcot district, as a result of the reduction both in the entrance fees and the quantity eligible for the competition. Better response leading to a larger-scale enlistment of competition is expected in the future.

State Marketing Officer, Madras.

Quality Variations in Groundnuts Marketed in South Arcot District Summer Crop of 1954

by

K. V. NATESAN, B. Sc., (Ag.),
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The South Arcot Markets for groundnut are purely spot markets. The produce that comes for sale contains moisture ranging anywhere between 2 and 10%, besides refraction such as stones, dust and other foreign matter, shrivelled, broken, split and damaged nuts and nooks in varied proportions. All these together with the moisture content are taken into consideration by the buyers in the determination of prices of the various lots exhibited for sale in the regulated markets of the district. In general the quality of groundnut marketed in the district is not up to the mark. This is due to various causes:

- (1) Harvesting pods before they are fully mature.
- (2) Want of proper drying of pods before decortication or hand-shelling by beat of sticks.
- (3) decortication, and of pods before shelling.

Foreign matter such as stones, dust and other impurities were within 4% in 94.8% of the samples. Nuts in shell were prevalent upto 10% in 95.5% of the samples, while broken splits ranged at 10% and 25% in 94.1% of the samples. Shrivelled kernels were in excess in the majority of the samples. High percentage of nooks were present at Cuddalore and Tirukoilur, while it was moderate at Vridhachalam and Villupuram and negligible at Tindivanam. All these different components when reduced to a common basis of refraction proportionate to the different classification provided in the All-India Standard form of contract show high variations from market to market. Vridhachalam and Tirukoilur recorded the lowest refractions, of 3.07%, 8.5% and 6.36% respectively.

The following observations can be made from the above processing details.

In Vridhachalam market samples contained a lesser percentage of foreign matter and other detracting components, with minimum moisture content in majority of the lots. In the markets of Cuddalore and Villupuram the samples were moist and also contained a high percentage of foreign matter and other refractive elements. Though Tindivanam recorded higher percentage of foreign matter and other components, it accounted for a low moisture content. Tirukoilur market accounted for higher percentage of moisture content, with less of foreign matter and other detracting elements.

The above observations are only broad indications, to draw attention to quality factors obtaining in the Regulated Markets of the Committee. The data requires closer scrutiny statistically, which the Committee hopes to undertake, as it becomes better equipped to handle the work.

Name of Market	and beaten	Hand shelled and hand beaten		Average dryage	Average refraction reduced to a common basis
	Quantity	No. of samples	Quantity		
Cuddalore	3,015	20	17	5.66	10.07
Tindivanam	471	..	..	3.86	8.51
Tirukoilur	560	..	..	6.93	3.91
Villupuram	1,208	..	..	6.32	6.35
Vridhachalam	1,913	..	..	3.30	3.07

Harvest and Interval between harvest and Sale.

Name of Market	Interval Between Harvesting Times				Interval Between Harvesting and Marketing			
	Early lots	Normal lots	Late lots	Very late lots	1 week and below	1 to 2 weeks	2 to 4 weeks	One month
Cuddalore	141	301	114	95	163	489	116	22
Tindivanam	104	259	87	35	103	273	25	..
Tirukoilur	138	192	102	64	240	400	62	..
Villupuram	54	204	216	60	196	322	106	..
Vridhachalam	100	340	120	30	Not more than a month.			

Name of Market	Quantity	Moisture between 8 & 10% Samples	Quantity	Above 10% Samples	Quantity	Average Dryage
Cuddalore	798	76	297	43	55	5.66
Tindivanam	155	5	19	2	6	3.86
Tirukoilur	181	85	304	86	225	6.98
Villupuram	147	73	338	21	82	6.32
Vridhachalam	34	13	38	10	14	3.30
Percentage in refraction as ag		..	..	5.1	..	..

A Note on "The System of Sales of 'Supari' (Arecanut)" in the Mangalore Market

by

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Secretary, South Kanara Market Committee, Mangalore

Broken		Nooks			Shrivelled		Total No. of samples
10% and below	Above 10%	5% and below	Above 5% upto 10%	Above 10%	2% and below	Above 2%	
773	75	519	239	90	200	648	848
351	40	375	16	..	35	356	391
702	..	319	256	127	183	519	702
584	64	583	106	9	69	579	648
626	30	490	154	22	238	418	656
3,036	209	2,276	771	248	725	2,520	3,245
93.5	6.4	68.6	23.8	7.6	22.3	77.6	..

gory.		Total bags.					
3,877	330	2,807	958	442	825	3,382	4,207
1,053	117	1,130	40	..	72	1,098	1,170
2,243	..	1,036	798	409	639	1,604	2,243
2,504	256	2,284	473	23	237	2,523	2,760
2,038	108	1,571	503	72	714	1,452	2,146
11,715	811	8,808	2,772	946	2,487	10,039	12,524
92.6	6.4	70.5	22.0	7.5	19.8	80.2	..

Mangalore is the main assembling centre for arecanuts in South Kanara. Even the produce purchased by dealers in the interior places, is finally brought to Mangalore for sale to the shippers. Over 2,00,000 cwts. of "Supari" valued at over three crores of rupees is bought and sold at Mangalore, the sellers' commission alone paid on these sales amounting to over Rs 7,00,000 per year.

There are a number of commission agents at Mangalore who undertake to stock and arrange to sell these commodities. Regular transport lorry services are available to bring the produce from almost all parts of the district. The grower sends his produce through these transport lorries to his commission agent with necessary instructions for its sale. The commission agent receives the goods, stores it in safe custody in his godown, gives an advance of 70 to 80% of the value of the produce, if necessary, to the grower and then arranges for the sale of the produce. The sale is done as a secret bid under cloth cover, the bargaining being by secret code manipulations of the fingers of the commission agent. The highest bid is announced after each lot is sold and a rough record of the sales is maintained. This system of sale under cover of cloth is followed not only for the sale of arecanuts but for almost all the commodities in the Mangalore market.

The main defect of this system of secret sale is that the producer has to depend only on the commission agent for all his sales. There is no definite record to show the particular trend of bidding in a transaction. The grower will be kept completely in the dark as to details of bargaining, the final price only being given out to him.

In a regulated market, where a fair deal is to be ensured, this system of secret bid under the cover of cloth which gives room for suspicion and doubt, has no place at all and should be banned. An open system like the one done at the market yards of South Arcot district — the chit tender system — may usefully be introduced in all the regulated markets, so that the sales may be in a simple form intelligible to the growers of these crops.

Readers of the Madras Agricultural Journal may recall the article by Sri C. Raman Moosad on "The different modes of price fixation in regulated and unregulated markets" which appeared in this Journal, Vol. XLI, 1954. In the present article is explained the system of sale of Supari (Arecanuts) in Mangalore market. A few more such articles on the sales procedure in other markets and for commodities typical to them will be published in subsequent issues.

Editor, M. A. J.

THE MADRAS AGRICULTURAL JOURNAL

Hints to Contributors

The pages of the Madras Agricultural Journal shall be open ordinarily only to the members of the Madras Agricultural Students' Union.

All articles for publication should be addressed to the Editor, Madras Agricultural Journal, Lawley Road P. O., Coimbatore.

In view of the high cost of printing, contributions should be as concise as possible and should conform to the best usage in the leading Journals published in India and abroad.

Manuscripts should be typed with double spacing on one side of the paper only and with wide margin. They should not ordinarily exceed 5,000 words or 12 pages of printed matter including tables and illustrations in the Journal. Manuscripts should be carefully revised; numerical data and calculation checked. Main headings in the text should be typed in capitals with paragraph indentations and followed by a period and two hyphens. Sub-heads should be lower case and be underlined to indicate italics. Latin nomenclature and local terms etc., should be in italics. Original papers must conclude with a summary of not more than 300 words, drawing attention to the main facts and conclusions.

Tables: The number of tables should be restricted to those absolutely necessary, as numerous tables detract from the readability of the article. Each table should be numbered consecutively from 1 up and must have a heading stating its contents clearly and concisely. The tables are to be typed on separate sheets with their positions marked in the text.

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